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ORIGINAL ARTICLES.

THE REMOVAL OF STONE IN THE BLADDER.[1]

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IT is my purpose to demonstrate:

1. The measured crushing resistance of vesical calculi.

2. The measured strength of the lithotrite.

3. The lithotrite from a mechanical point of view.

4. A new lithotrite.

Given the problem—a stone in the bladder, a limited viaduct to reach it: remove the stone without injuring the parts. There are two unknown factors in this problem: First, the crushing resistance of the stone, and second, the strength of the lithotrite used in reducing the stone so that it may be removed with facility. Knowing the crushing resistance of the strongest vesical calculus in our possession, we are in a position to proceed to so construct a lithotrite that we can successfully crush and safely remove such a stone were we to meet with it in the human bladder. So far as I know, the exact crushing resistance of a vesical calculus has never been stated by any writer. Such vague statements as "very hard," "very tough," "very large," etc., have been used in describing stones, but the measured crushing resistance of any stone taken from the human bladder has always been overlooked. The same may be said of the lithotrite. "Very strong," "very powerful," etc., have been the vague terms used in describing it; but its measured strength computed by any unit has never been stated. In order to inform myself exactly on these points I addressed a letter to the Librarian of the Surgeon-General's Office, Washington, asking for any information whatever the Library contained in regard to them, and his reply was that the Library contained nothing relating to the matter.

It is manifest, therefore, that I have entered an entirely new field of investigation. Now, with a perfect disposition to respect the written law of this body to study economy of time, I shall strive to aim at all practicable condensation and brevity. A very liberal expenditure, however, is at times demanded by the wisest economy; and if it shall be found—as I fear it may, from the almost elementary manner in which, to meet all exigencies, the questions that arise must be discussed—that my own outlay offends against the letter of the law, I hope it also will be found that it is in harmony with its spirit.

In order to attain the necessary knowledge for the solution of the problem in question, it is necessary first to measure the crushing resistance of a large number of stones taken from the human bladder, a very large number of every size, embracing the hardest, toughest, and largest specimens, for it must be borne in mind that it is especially these that we seek to investigate, rather than those that are small and readily broken by very moderate pressure. So far I have been able to collect from all sources only 184 human vesical calculi for this investigation.

The table herewith annexed, in which the results are given, is so arranged that any number can be added. I propose to continue these investigations, and from time to time I shall add and publish the results observed. I shall begin my task impressed with that fine saying of Coleridge: "The conditions of science should be weighed in the scales of a jeweller, and not like the commodities of the market on the weigh-bridge of common prejudice and vulgar error."

We find that the 184 vesical calculi tabulated are divided as follows:

Oxalate of lime	55
Phosphate of lime	64
Uric acid	27
Oxalate and phosphate mixed	15
Uric acid and phosphate mixed	8
Uric acid and oxalate mixed	7
Oxalate, phosphate, and uric acid mixed	4
Combustible, requiring further examination	2
Carbonate of lime and oxalate	1
Cystin	1
	184

Had time permitted, the grouping of the calculi in the table below would have been made on the basis of their chemical constitution, as indicated in the foregoing summary.

At some future time this grouping will be arranged and all additions to it will be made upon this basis.

[1] Read before the American Surgical Association, June 1st, 1894, during the Triennial Congress of American Physicians and Surgeons.

TABLE OF THE MEASURED CRUSHING RESISTANCE OF 184 VESICAL CALCULI.

No.	Appearance of calculus.	Composition of calculus.	Diameters, in millimeters.	Volume, in cubic centimeters.	Weight, in ounces and grains.	Specific gravity (approximate).	Axis of holding between jaws of lithotrite.	Actual crushing resistance of calculus, in lbs., with Forbes' lithotrite; friction of lithotrite and testing apparatus deducted.	Direction of fracture to line of force applied.	Time slowly increasing pressure was applied to calculus, in min.	Number of fragments.	Flying fragments.	Distance fragments were thrown, in inches.	Size of lithotrite used (French scale).	Impaction of lithotrite, measured by increased size, in degrees of French scale.	Point of fracture in lithotrite.	Calculus loaned by
1	Smooth	Inside oxalate, outside phosphate.	32-38-54	36	1-392	1.577	Short	264.25	Coincident	10	2	None	None	33			
2	"	Uric acid . .	14-25-31	6.7	0-130	1.272	"	105.00	Radiating	1	Many	"	"	30			
3	"	Phosphate of lime	25-33-39	17	0-368	1.410	"	60.46	Coincident	½	3	"	"	30			
4	Granulated	Uric acid . .	20-25-36	8.5	0-180	1.379	"	150.00	"	4	5	Some	18	30			
5	Smooth	Phosphate . .	18-22-34	5.5	0-155	1.836	"	30.23	"	¼	3	None	None	30			
6	Granulated	Oxalate . .	25-29-32	10.5	0-233	1.445	"	50.39	"	1	2	"	"	30			
7	Smooth	Phosphate . .	15-26-32	6	0-145	1.574	"	140.00	"	4	2	"	"	30			
8	"	Oxalate . .	14-21-25	4.5	0-116	1.685	"	162.00	Crucial	4	4	"	"	30			
9	"	Phosphate . .	14-24-28	5	0-114	1.485	"	90.00	Coincident	1¾	4	"	"	30			
10	"	" . .	34-42-54	39	1-427	1.598	"	79.50	"	4	2	"	"	33			
11	"	" . .	24-32-53	22.5	1-110	1.708	"	59.50	"	1½	2	"	"	33			
12	"	" . .	23-32-55	23.7	1-44	1.440	"	67.00	"	2	2	"	"	33			
13	"	" . .	25-32-41	19.8	0-396	1.302	"	110.50	Radiating	2	4	"	"	33			
14	"	" . .	7-16-32	1.3	0-33	1.654	"	50.00	Coincident	1¾	4	"	"	30			
15	"	" . .	9-17-21	1.1	0-31	1.836	"	62.00	"	2	2	"	"	30			
16	"	Uric acid . .	28-35-38	17	0-413	1.582	"	142.50	"	4	3	"	"	33			
17	"	Oxalate . .	41-57-68	77	3-303	1.474	"	214.00	Radiating	6	4	Two	12	33			
18	"	Phosphate . .	25-35-42	16.9	0-340	1.310	"	79.50	Coincident	3	3	None	None	33			
19	"	" . .	20-22-25	6.2	0-116	1.218	"	66.00	Radiating	1	Many	"	"	30			
20	"	" . .	15-21-24	4.5	0-68	1.085	"	65.00	Coincident	1½	2	"	"	30			
21	"	" . .	24-27-28	10.1	0-180	1.173	"	74.00	Radiating	3	5	"	"	30			
22	Nodulated	" . .	35-40-60	34.5	1-99	1.888	"	25.20	Coincident	¾	2	"	"	30			
23	Smooth	Uric acid . .	10-19-23	3.2	0-58	1.178	"	83.00	Radiating	5	Many	"	"	30			
24	"	Phosphate . .	25-28-29	8	0-162	1.311	"	98.00	"	3	4	"	"	30			
25	"	" . .	18-26-37	10.6	0-203	1.241	"	90.00	Coincident	2½	2	"	"	30			
26	"	Oxalate . .	12-21-31	3.6	0-78	1.411	"	60.00	"	2¾	Many	"	"	30			
27	Nodulated	" with little uric acid intermixed.	35-39-48	34	1-435	1.753	"	406.00	"	11	2	Two	18	33			
28	Smooth	Phosphate . .	29-44-50	32	1-166	1.335	"	131.25	"	8	3	None	None	33			
29	"	" . .	23-39-45	20.3	0-388	1.245	Intermediate	31.50	"	½	Many	"	"	33			
30	"	Uric acid . .	17-32-40	12.5	0-285	1.485	Short	51.00	"	1½	3	"	"	30			
31	"	Oxalate . .	12-18-22	3	0-61	1.324	"	79.50	"	3	2	"	"	33			
32	"	Inside uric acid, outside phosph.	40-46-78	69.5	2-417	1.290	"	122.25	"	5	Many	"	"	33			
33	"	Phosphate . .	10-18-41	4.2	0-81	1.256	Intermediate	31.50	"	1	2	"	"	33			
34	"	" . .	5-12-17	7	0-12.5	1.163	Short	21.00	"	1	3	"	"	33			
35	"	" . .	48-50-66	79.5	3-270	1.412	"	280.00	"	11	2	"	"	33			
36	"	" . .	15-17-22	3.1	0-50	1.050	"	10.07	"	¼	2	"	"	30			
37	"	Oxalate . .	20-22-38	9.5	0-204	1.302	"	162.00	"	9	5	"	"	30			
38	Rough,	Uric acid . .	42-60-66	79.5	3-459	1.556	"	110.50	"	3	2	"	"	33			
39	" mammillated	Inside oxalate, outside phosph.	30-44-56	38	2-6	1.655	"	187.86	"	8	3	One	10	33			
40	Smooth	Oxalate . .	26-32-35	14.6	0-311	1.387	"	160.24	"	7	3	Some	20	33			
41	"	Inside uric acid, outside phosph.	15-20-22	3.7	0-62	1.091	"	50.00	"	1½	4	None	None	30			
42	"	Uric acid . .	18-39-48	17.5	0-417	1.552	"	150.00	"	5¼	2	One	18	30			
43	"	Inside uric acid, outside phosph.	30-37-59	35.5	1-372	1.563	"	122.25	"	3	2	None	None	33			
44	Smooth, irregular	Inside phosphate with oxalate, outside phosph.	25-34-50	18	0-371	1.342	"	131.25	"	4	2	"	"	33			
45	Smooth, flat	" " "	15-36-39	8.7	0-173	1.295	"	131.25	"	5	2	"	"	33			
46	Rough	Phosphate . .	15-24-30	5	0-90	1.172	"	62.00	"	1½	3	"	"	30			
47	Smooth	Oxalate . .	24-30-45	17.8	0-406	1.485	"	183.62	"	2½	3	Some	18	33			
48	"	Phosphate . .	19-22-34	4.8	0-93	1.262	"	110.00	"	3	2	None	None	30			
49	Lobulated	Uric acid . .	22-29-31	9.8	0-241	1.602	"	122.25	"	3	3	"	"	33			
50	"	" " . .	11-17-18	1.7	0-40	1.533	"	34.12	"	3	3	"	"	33			
51	Smooth	" " . .	10-14-16	1.3	0-29	1.453	"	21.00	"	1	2	"	"	33			
52	"	" " . .	11-12-14	18	0-8	1.384	"	36.74	"	1	2	"	"	33			
53	"	" " . .	7-10-11	0.4	0-10	1.628	"	44.50	"	2	2	"	"	33			
54	"	" " . .	7- 8-10	0.3	0-7	1.521	"	42.00	"	3	Many	"	"	33			
55	"	Inside uric acid, outside phosph.	30-32-43	24	0-479	1.300	"	173.00	"	6	2	"	"	33			
56	Mammillated	Oxalate, bloodclot inside.	20-26-35	10.2	0-194	1.239	"	30.23	"	½	Many	"	"	30			
57	"	Oxalate . .	15-21-27	4.6	0-114	1.614	"	156.00	"	7	2	"	"	33			
58	Smooth	Inside oxalate, middle uric acid, outside phosph.	17-30-38	10.1	0-229	1.477	"	105.00	"	5	2	"	"	30			
59	"	Inside uric acid, outside oxalate.	17-22-27	6	0-133	1.444	"	138.00	"	7	2	"	"	33			
60	"	Phosphate . .	21-31-38	14	0-297	1.382	"	82.00	"	2	4	"	"	33			
61	Granular	Cystin . .	13-20-27	3.7	0-80	1.408	"	62.00	"	1	2	"	"	33			
62	Rough, mammillated	Oxalate . .	17-20-22	3.6	0-87	1.574	"	126.75	"	7½	2	"	"	33			
63	Smooth	Phosphate . .	15-22-26	4.8	0-97	1.316	"	93.87	"	2	2	"	"	33	None	None	Jefferson Medical College
64	"	Inside oxalate, outside phosph.	27-32-40	17.2	0-402	1.522	"	187.86	Crucial	8	4	Some	24	32			

No.	Appearance of calculus.	Composition of calculus.	Diameters, in millimeters.	Volume, in cubic centimeters.	Weight, in ounces and grains.	Specific gravity (approximate).	Axis of holding between jaws of lithotrite.	Actual crushing resistance of calculus, in lbs., with Forbes' lithotrite; friction of lithotrite and testing apparatus deducted.	Direction of fracture to line of force applied.	Time slowly increasing pressure was applied to calculus, in min.	Number of fragments.	Flying fragments.	Distance fragments were thrown, in inches.	Size of lithotrite used (French scale).	Impaction of lithotrite, measured by increased size, in degrees of French scale.	Point of fracture in lithotrite.	Calculus loaned by
65	Smooth	Phosphate . .	30-33-35	18. 2	0-295	1. 055	Short	89. 11	Coincident	4	2	None	None	33			
66	"	" . .	17-29-36	10. 6	0-241	1. 481	"	86. 74	"	3	2	"	"	33			
67	"	" . .	15-23-34	5. 7	0-112	1. 280	"	39. 36	"	2	2	"	"	33			
68	"	Combustible, further examination necessary.	21-25-28	8	0-144	1. 172	"	42. 00	"	1½	2	"	"	33			
69	"	Phosphate . .	30-42-55	37. 5	1-379	1. 492	"	110. 50	"	5	3	"	"	33			
70	Rough	Oxalate . .	20-22-30	7. 9	0-170	1. 401	"	39. 36	"	2	2	"	"	33			
71	Smooth	Phosphate . .	36-38-67	36. 5	1-133	1. 094	"	140. 25	"	8	2	"	"	33			
72	"	Oxalate . .	29-35-40	21. 5	1-5	1. 469	"	89. 11	"	3	2	"	"	33			
73	"	Phosphate . .	24-27-47	16. 3	0-345	1. 378	"	106. 74	"	4½	2	"	"	33			
74	"	" . .	12-19-29	5	0-88	1. 146	"	47. 00	"	3	2	"	"	33			
75	Mammillated	Oxalate . .	18-23-25	5. 3	0-131	1. 610	"	154. 75	"	12	3	Some	12	33			
76	Lobulated	" . .	16-19-24	3. 7	0-90	1. 584	"	62. 00	"	3½	3	None	None	33			
77	Nodulated	Inside bloodclot, outside oxalate.	18-31-40	10. 2	0-175	1. 117	"	39. 36	"	2	3	"	"	33			
78	Smooth	Inside uric acid, outside phosph.	28-36-44	25. 5	1-56	1. 368	"	117. 61	"	4½	2	"	"	33			
79	Mammillated	Oxalate . .	14-20-25	2. 2	0-52	1. 505	"	15. 74	"	1	Many	"	"	33			
80	Smooth	" . .	22-45-46	22	0-457	1. 353	"	72. 00	"	2	2	"	"	33			
81	Rough, mammillated	" . .	9-12-18	1. 3	0-19	1. 008	"	21. 00	Radiating	1½	Many	"	"	33			
82	Smooth	Phosphate . .	18-19-22	3. 6	0-56	1. 013	Intermediate	49. 50	Coincident	1½	2	"	"	33			
83	"	Uric acid . .	17-23-30	6. 5	0-129	1. 292	Short	57. 00	"	2½	2	"	"	33			
84	Nodulated	Oxalate . .	23-26-32	9. 1	0-245	1. 753	"	162. 36	"	9	2	"	"	33			
85	Smooth	" . .	26-32-50	24	0-410	1. 107	"	89. 11	"	3½	2	"	"	33			
86	"	Combustible, further examination necessary.	35-38-46	27	0-429	1. 034	"	34. 12	"	1	2	"	"	33			
87	Mammillated	Oxalate . .	10-13-19	1. 4	0-26	1. 209	"	89. 11	Radiating	4	3	One	6	33			
88	Nodulated	Phosphate . .	16-22-27	5. 1	0-107	1. 366	"	91. 50	"	5	4	None	None	33			
89	Smooth	" . .	18-26-32	8. 2	0-170	1. 351	"	103. 37	"	5	Many	"	"	33			
90	"	" . .	26-36-47	23	0-405	1. 147	"	31. 50	Coincident	1	2	"	"	33			
91	"	Oxalate . .	16-21-30	5	0-99	1. 238	"	36. 74	Crucial	3½	Many	"	"	33			
92	"	" . .	22-28-32	9. 8	0-252	1. 675	"	135. 75	Coincident	8	2	"	"	33			
93	Rough, mammillated	" . .	16-27-32	6. 7	0-141	1. 379	"	26. 24	"	1½	2	"	"	33			
94	Smooth	Phosphate . .	10-13-25	1. 8	0-38	1. 375	"	49. 50	"	2	2	"	"	33			
95	Nodulated	Inside uric acid, outside oxalate mixed with uric acid.	22-24-27	7. 7	0-192	1. 624	"	185. 74	"	7½	3	Two	24	33			
96	Mammillated	Phosphate with small amount of oxalate mixed in	15-16-26	2. 9	0-54	1. 218	"	44. 50	Radiating	2	Many	None	None	33	None	None	Jefferson Medical College.
97	Smooth	" " "	8- 9-10	0. 3	0-7	1. 520	"	15. 74	"	¾	"	"	"	33			
98	"	" " "	7- 8- 9	0. 2	0-4	1. 302	"	31. 50	"	1½	"	"	"	33			
99	"	Inside uric acid, outside phosph.	16-18-29	4. 9	0-86	1. 143	"	36. 74	Coincident	1	2	"	"	33			
100	"	Oxalate . .	17-20-23	4. 1	0-93	1. 477	"	89. 11	"	5	2	"	"	33			
101	Nodulated	" . .	18-30-35	8. 6	0-202	1. 537	"	98. 61	"	4¼	2	"	"	33			
102	Rough, nodulated	" . .	21-22-24	4. 4	0-106	1. 584	"	210. 00	"	13	2	One	72	33			
103	Mammillated	Inside uric acid, outside oxalate. and phosphate.	13-21-30	4. 5	0-97	1. 418	"	74. 50	Radiating	3	Many	None	None	33			
104	Rough	Oxalate . .	18-21 27	4. 6	0-125	1. 770	Intermediate	126. 75	Coincident	5	2	"	"	33			
105	Smooth	Fatty substance inside, outside oxalate.	12-13-14	1. 6	0-33	1. 343	"	98. 61	Radiating	4	3	One	12	33			
106	Rough	Oxalate . .	16-35-39	10. 3	0-227	1. 435	Short	93. 87	"	3⅓	3	None	None	33			
107	Smooth	Uric acid . .	23-33-40	18. 3	0-458	1. 630	"	140. 25	"	3	Many	"	"	33			
108	"	" " . .	22-32-40	17. 3	0-437	1. 645	"	77. 00	"	2⅓	"	"	"	33			
109	Rough	Phosphate . .	18-22-34	7. 3	0-138	1. 231	"	89. 11	Coincident	3	2	"	"	33			
110	Smooth	Oxalate . .	43-53-70	79. 5	3-336	1. 302	"	129. 00	"	4	Many	"	"	33			
111	"	Phosphate . .	33 34-39	23. 8	0-448	1. 253	"	72. 00	"	2	2	"	"	23			
112	"	" . .	23-25-26	7. 6	0-141	1. 208	"	47. 00	"	1½	3	"	"	33			
113	"	" . .	21-22-36	7	0-133	1. 247	Intermediate	49. 50	"	1	2	"	"	33			
114	"	" . .	22-23-25	6. 9	0-130	1. 227	Long	36. 74	"	1	3	"	"	33			
115	"	" . .	19-20-29	6. 5	0-112	1. 122	"	53. 00	"	1½	3	"	"	33			
116	"	" . .	15-17-30	4. 5	0-80	1. 158	Short	31. 50	"	1	2	"	"	33			
117	"	" . .	13-15-24	2. 7	0-42	1. 013	"	34. 12	"	1	2	"	"	33			
118	"	" . .	12-15-17	1. 9	0-30	1. 371	"	26. 24	Radiating	1	Many	"	"	33			
119	Rough	" . .	12-20-28	4. 1	0-67	1. 064	"	39. 36	Coincident	2	2	"	"	33			
120	Smooth	Uric acid . .	22-38-58	31	1-275	1. 586	"	126. 75	Radiating	5	4	"	"	33			
121	"	Oxalate . .	15-20-28	5. 1	0-98	1. 124	"	36. 74	Coincident	1	3	"	"	33			
122	Nodulated	" . .	16-23-30	6. 3	0-171	1. 768	"	162. 36	"	6	2	"	"	33			
123	"	" . .	26-34-44	21	1-97	1. 789	"	93. 87	Radiating	4	Many	"	"	33			
124	Rough, mammillated	Phosphate . .	20-22-44	8. 5	0-173	1. 325	"	133. 50	Coincident	6	4	"	"	33			
125	" "	" . .	15-17-20	2. 7	0-44	1. 061	"	44. 50	"	1	3	"	"	33			
126	Smooth	" . .	12-19-24	3. 2	0-67	1. 364	"	74. 50	Radiating	4	3	"	"	33			
127	Lobulated	Inside uric acid, outside oxalate.	17-25-30	8. 3	0-237	1. 860	"	179. 36	Coincident	15	3	One	6	33			

No.	Appearance of calculus.	Composition of calculus.	Diameters, in millimeters.	Volume, in cubic centimeters.	Weight, in ounces and grains.	Specific gravity (approximate).	Axis of holding between jaws of lithotrite.	Actual crushing resistance of calculus, in lbs., with Forbes' lithotrite; friction of lithotrite and testing apparatus deducted.	Direction of fracture to line of force applied.	Time slowly increasing pressure was applied to calculus, in min.	Number of fragments.	Flying fragments.	Distance fragments were thrown, in inches.	Size of lithotrite used (French scale).	Impaction of lithotrite, measured by increased size, in degrees of French scale.	Point of fracture in lithotrite.	Calculus loaned by
128	Smooth	Phosphate . .	23-29-41	16.8	0-316	1.225	Short	98.61	Coincident	2½	2	None	None	33			
129	Nodulated	Oxalate . .	13-22-25	4.9	0-113	1.502	"	242.61	Crucial	10	5	"	"	33			
130	Mammillated	" . .	7-11-16	0.7	0-16	1.498	"	49.50	Radiating	1	4	"	"	33			
131	"	" . .	11-13-17	1.3	0-26	1.302	"	39.36	Coincident	1	3	"	"	33			
132	Rough, nodulated	" . .	25-30 35	12.5	0-335	1.745	"	147.00	"	6	2	One	6	33			
133	Coral shape.	" . .	32-41-44	25	1-223	1.832	"	280.00	"	11	2	None	None	33			
134	" "	" . .	31-37-40	19	1-40	1.782	"	390.00	"	14	2	One	72	33			
135	Granulated	Phosphate with oxalate.	42-50-67	65	2-462	1.427	"	206.00	"	5	2	None	None	33			
136	Mammillated	Inside oxalate, outside phosph.	14-19-24	3.1	0-72	1.513	"	98.61	Radiating	3⅓	Many	"	"	33			
137	Crystalline	Oxalate . .	19-30-34	9.2	0-242	1.713	"	222.00	Coincident	9½	2	One	12	33			
138	Smooth	Phosphate with oxalate.	13-25-35	6.6	0-155	1.520	"	64.50	"	2½	3	None	None	33			
139	"	Inside uric acid, outside phosph.	25-31-45	18.4	0-385	1.352	"	64.00	"	2	2	"	"	33			
140	"	Inside oxalate, outside phosph.	20-30-36	12.4	0-321	1.686	"	124.50	"	6	2	"	"	33			
141	Rough, mammillated	Oxalate . .	20-30 42	12.3	0-264	1.398	"	89.11	"	2½	2	"	"	33			Jefferson Medical College.
142	Mammillated	" . .	9-11-16	0.8	0-16	1.302	"	47.00	Radiating	3	Many	"	"	33			
143	Nodulated	" . .	10-12-14	0.9	0-22	1.592	"	39.36	"	1	"	"	"	33			
144	Smooth	Phosphate . .	5- 6-11	0.2	0-5	1.622	"	26.24	"	1	2	"	"	32			
145	Rough	Phosphate with little oxalate.	10-16-18	1.9	0-31	1.062	Intermediate	31.50	Coincident	1	2	"	"	33			
146	Smooth	Phosphate with little oxalate.	8-10 12	0.4	0-8	1.305	Short	18.36	Radiating	¾	Many	"	"	33			
147	"	Oxalate . .	10-13-15	1.4	0-23	1.070	"	39.36	"	1½	"	"	"	33			
148	Rough	" . .	12-16-22	2.5	0-44	1.143	"	21.00	"	½	"	"	"	33			
149	Shell	" . .	8-14-22	0.4	0-19	1.428	"	5.24	"	¼	"	"	"	33			
150	Smooth	Phosphate . .	41-43-50	48.5	2-288	1.509	"	238.87	Coincident	8	"	Some	30	33			
151	"	Phosphate with piece of iron in center.	26-31-46	20	0-451	1.468	"	89.11	"	2¼	2	None	None	33			
152	"	Oxalate . .	24-35-40	19.3	1-1	1.623	"	142.50	"	4	3	"	"	33			
153	Granulated	" . .	44-52-60	65.5	3-260	1.690	"	133.50	"	4	2	"	"	32			
154	"	Inside carbonate of lime, outside oxalate.	53-63-85	130	6-313	1.600	"	152.50	"	4	2	"	"	33			
155	Smooth	Uric acid . .	32-39-69	42.5	2-121	1.655	"	260.75	"	14	3	One	10	33			Dr. Reckefus, Jr.
156	"	Phosphate . .	16-27-38	9.2	0-171	1.232	"	57.00	"	1½	2	None	None	33			
157	"	Uric acid . .	13-17-21	3.3	0-57	1.125	"	82.00	"	2½	2	One	10	33			
158	"	" " . .	12-17-18	2.7	0-46	1.106	"	79.50	"	2	2	None	None	33	None	None	
159	"	" " . .	11-16-20	2.5	0-44	1.146	"	91.50	Crucial	3	4	One	12	33			
160	"	" " . .	20-31-42	15.5	0-392	1.649	"	52.00	"	1	3	None	None	33			
161	Mammillated	Phosphate . .	18-21-33	10.6	0-187	1.149	"	126.75	"	5	4	Two	20	33			
162	"	Oxalate . .	17-23-28	6.4	0-149	1.517	"	210.00	"	14	5	None	None	33			
163	Smooth	Inside oxalate outside phosph.	21-31-38	14	0-313	1.456	"	79.50	Coincident	3	2	"	"	33			
164	Smooth and nodulated	Oxalate . .	21-29-36	11	0-267	1.581	"	77.00	Crucial	3	3	"	"	33			Dr. O. Horwitz.
165	Smooth	Uric acid . .	17-34-42	13.1	0-291	1.447	"	117.61	Coincident	4	2	One	12	33			
166	Mammillated	Inside uric acid, outside oxalate.	15-20-23	3.6	0-81	1.466	"	109.11	Crucial	3	5	None	None	33			
167	Smooth	Phosphate . .	27 28-40	15.6	0-268	1.119	Intermediate	21.00	Coincident	1	2	"	"	33			
168	"	Uric acid mostly, outside uric acid mixed with phosphate and oxalate.	24-41-55	27.5	1-102	1.378	Short	69.50	"	1½	2	"	"	33			
169	"	Phosphate . .	32-42-50	37.5	1-262	1.288	"	59.50	"	4	4	"	"	33			Dr. J. A. Peoples.
170	"	Oxalate . .	27-47-53	38.5	1-420	1.523	"	98.61	"	4	5	"	"	33			
171	Granulated	Phosphate . .	32-40-60	38.2	1-367	1.444	"	59.50	"	2	2	"	"	33			
172	Smooth	Center oxalate, intermediate layer uric acid, outside phosph.	44-52-67	84.5	3-446	1.454	"	101.00	Radiating	4	Many	"	"	33			Dr. Jos. Hearn.
173	Nodulated	Uric acid . .	31-37-43	30	1-281	1.652	"	338.24	Coincident	5	2	"	"	33			
174	Smooth	Phosphate . .	8-15-16	1	0-22	1.433	"	34.12	"	1	3	"	"	33			Jeff. Med. Coll.
175	"	Inside uric acid, outside phosph.	25-25-31	9.3	0-160	1.120	"	72.00	Radiating	3	Many	"	"	33			Dr. A. Hewson. Dr. W. S. Forbes.
176	"	Phosphate . .	15-22-30	4.7	0-104	1.441	"	39.36	Coincident	1	2	"	"	33			
177	"	Oxalate . .	29-42-51	37	1-471	1.674	"	82.00	Radiating	2	Many	"	"	33			Dr. A. Hewson.
178	"	Uric acid with little oxalate.	15-18-27	4.1	0-92	1.461	"	42.00	Crucial	1	5	"	"	33			
179	Rough	Phosphate . .	13-19-26	2.9	0-72	1.617	"	7.86	"	½	Many	"	"	33			
180	Smooth	Uric acid . .	14-15-16	2	0-50	1.625	"	26.24	"	1	"	"	"	33			
181	"	" "	13-15-17	1.9	0-49	1.680	Long	49.50	"	1½	"	"	"	33			Dr. Jos. Hearn.
182	"	" "	13-14-17	1.8	0-45	1.628	Short	86.74	"	3	"	"	"	33			
183	"	Inside uric acid, outside oxalate.	13-15-16	1.6	0-44	1.791	"	86.50	"	2½	"	"	"	33			
184	"	Oxalate . .	13-14-16	1.4	0-37	1.721	"	49.50	"	1⅓	"	"	"	33			

NOTE.—I am indebted to Professor Henry Leffmann, M.D., Pathological Chemist to Jefferson Medical College Hospital, for the chemical analysis of these vesical calculi.

Attention is called to the large percentage of oxalate of lime calculi. This is probably accounted for from the fact that they had been especially cared for by their collectors, while other stones not receiving such attention were lost.

I have attempted to deduce from this table a general law for the crushing resistance of vesical calculi, considered under the heads of chemical composition, weight, size, and specific gravity, but owing to the great variation in the ages of the calculi since being removed from the bladder (from one to seventy years) and the consequent hardening or softening of the colloids due to atmospheric exposure, it has been found impracticable for the present at least. It would seem, however, as one element of the law, that there is a marked decrease in the crushing resistance of vesical calculi relatively to their size and weight as they grow larger.

The crushing resistance and other physical properties such as size, weight, etc., of the calculus are as much as its chemical composition a part of its clinical history. Hereafter by the use of this new lithotrite, having the measuring mechanism in its handle, the crushing resistance of a calculus will be recorded at the time of the operation.

Thus, in time a table may be compiled from the reports of observing lithotritists which will enable a more judicious selection of a lithotrite of proper size for the reduction of a given calculus.

It is my purpose to demonstrate from experiments the relative crushing resistance of vesical calculi and the strength of the new lithotrite. The line of safety in this new lithotrite will be pointed out by having stamped on its handle, with the maker's name, the number of pounds to which the instrument has been safely tested in a machine which has been made for this purpose, before it leaves the maker's shop.

The testing machine and the lithotrite were designed and made by my son, Mr. John S. Forbes, engineer.

I will venture to ask permission to allow him to describe them.

TESTING APPARATUS. (BY MR. JOHN S. FORBES.)

This apparatus (Fig. 1) consists first of a rigid frame of wrought-iron pipe, A; second, of a longitudinally adjustable cast-iron bridge, B, spanning the frame and secured at any point by clamps, C C. Mounted on this bridge is a universal brass clamp, D. for holding the cylindrical handle of the lithotrite,

A cast-iron bed-plate, E, spans the frame and is secured at one end of it. This bed-plate carries a rotatable shaft, F, turning in ball-bearings, whereby the friction is reduced to a minimum. This shaft also has an end movement of about one and a quarter inches. One end of the shaft is provided with an independent four-jaw chuck, G, for holding and turning the screw-handle of the lithotrite. Upon the middle portion of the shaft, and between the ball-bearings, is a flat, grooved, brass wheel, H, so arranged that it may be turned independently of the shaft or locked to it. Secured to the wheel is a cord, I, which passes over an overhead grooved pulley, J, and is provided at its dependent end with a pan, K, for the reception of weights. The friction due to turning the wheel and its accompanying parts, and weight of the pan is eliminated by the small bottle, L, containing shot. The operation of the apparatus is as follows:

A lithotrite is placed in position and its cylindrical handle clamped with the brass clamp, D, on the cast-iron bridge. The screw-handle is secured in the four-jaw chuck, G, on the rotatable shaft, and the whole is gotten in perfect line and accord. By locking the instrument and turning the wheel, H, over to the right, the male jaw of the lithotrite is propelled toward the female jaw, and by unlocking the instrument the male jaw, together with the shaft, chuck, and wheel, may be slid backward and forward just as the instrument may be operated in the hands. The result so far, then, is that we have a lithotrite held in an apparatus, and the objects are: first, to measure the crushing resistance of a calculus placed between the jaws of the lithotrite; second, to learn what pressure may be obtained between the jaws of the lithotrite without injury to them or any other portion of the lithotrite; and third, what pressure between the jaws will break them or any other part of the lithotrite. In order to obtain the crushing resistance of a calculus held between the jaws of a lithotrite we must consider mathematically the mechanical elements of the testing apparatus and the lithotrite.

We may use the formula:

$P = p \times c \times w$ in which P = equals the pressure between the blades; p = the pitch of the screw in number of turns per inch; c = the circumference of the wheel, H, of testing apparatus; w = the weight in the pan, K, of the testing apparatus.

Thus it will be seen that the forces are inversely as the paths.

Now this will give us the theoretical pressure between the jaws, but we must consider the friction in the lithotrite arising from the screw-thread and the tendency of the male blade to buckle. In order to obtain this friction we place a dynamometer, or other pressure-recording instrument, between the jaws and apply weights to the pan of the testing apparatus. In this way we will get the coefficient or ratio of friction in the lithotrite to the weight applied for various pressures between the jaws. We can therefore lay out a table of actual frictions for each pressure. The formula must now have the factor of friction introduced, and it may be expressed thus:

$P = (p \times c \times w) - (F\ w)$ wherein F = the friction corresponding to the weight, w. The dynamometer is now removed and we are ready to measure the crushing resistance of any given calculus. The table of crushing resistance of vesical calculi which is before you was obtained in this way. In order to obtain the second and third objects, viz: the pressure which may be obtained between the jaws of the lithotrite without injury to any part of the in-

strument, and what pressure and where the instrument will first give way, we again make use of the dynamometer and apply weights to the pan of the testing apparatus until something happens, for something is bound to occur if we apply enough weights. The dynamometer ceases to move when this event takes place, and we read the ultimate pressure which the now useless lithotrite was able to record. In this manner the table of the strength of various lithotrites which is before you was obtained.

DESCRIPTION OF LITHOTRITE. (BY MR. JOHN S. FORBES.)

This lithotrite (Fig. 2) has some of the elements that are common to the Civiale, Thompson and

FIG. 1.

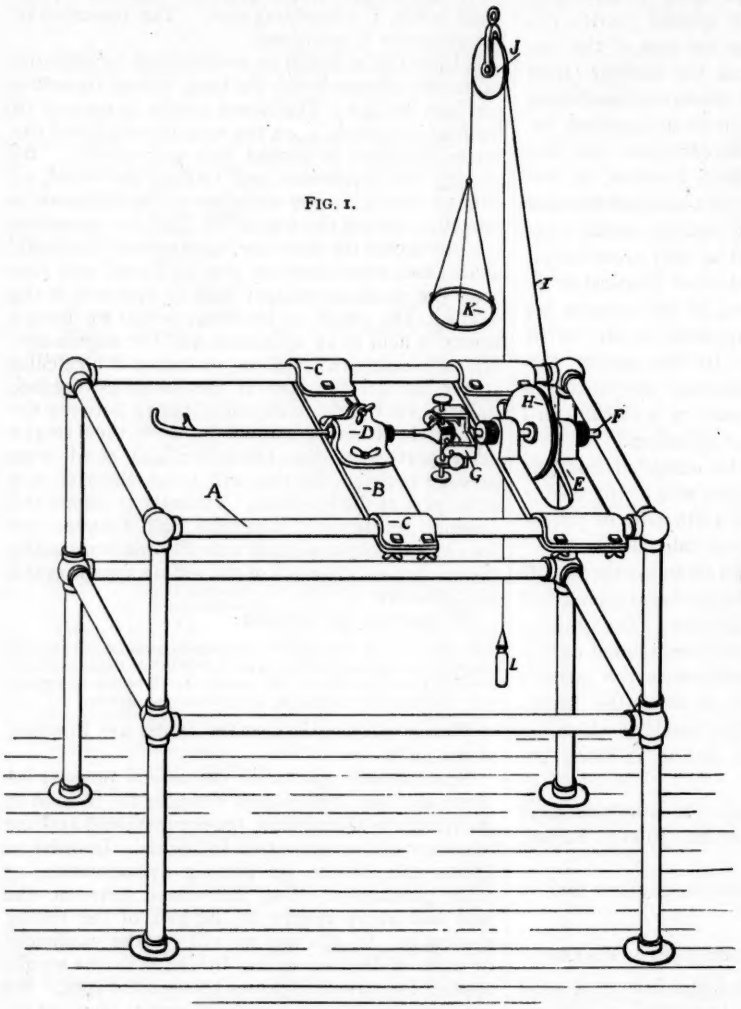


FIG. 5.

FIG. 6.

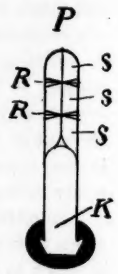


FIG. 7.

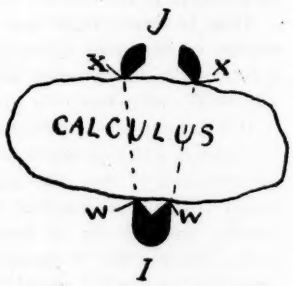


FIG. 8.

FIG. 2.

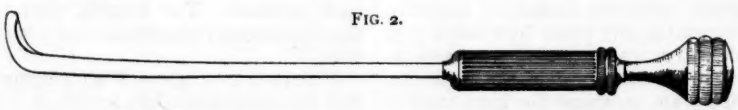
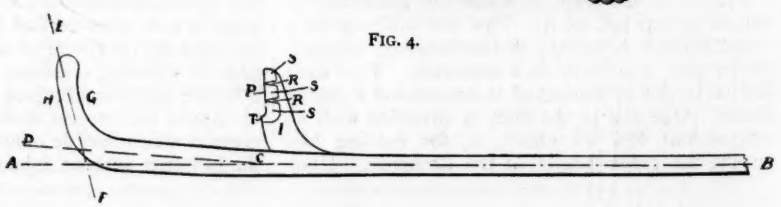


FIG. 3.

FIG. 4.



Bigelow instruments, viz: a pair of jaws capable of being separated and brought together and a handle mechanism for their operation. The construction and general lines of it are, however, entirely original and widely different from any lithotrite now in existence. It may be thus described:

The penile and vesical end consists of a male blade sliding within a female blade and held within the latter by means of a slightly angular under-cut slot, Fig. 3.

This is done to prevent the male blade rising out of the female when under a strain, so that the greater the strain the tighter the male blade is held within the female. The long axis, B C, Fig. 4, of the shaft is straight from the handle to within about two inches of the crook or curve; here it rises, C D, at an angle of about five degrees until it meets the curve.

This accomplishes six important objects: First, it gives an easy introduction of the instrument through the urethra, because of a wide angle. Second, it increases the strength of the female jaw by giving it support higher up. Third, it allows a larger stone to be grasped without incurring a long female jaw. Fourth, it places the metal of the female shaft where it is most needed to give strength. Fifth, it prevents side movement or twisting of the male jaw by giving it a deeper slot to move in, and thereby supporting it higher up, for the male blade works in a straight slot along the axis, A C B. Sixth, the angle between the axis, E F, of the female jaw and the long axis of the shaft, A C B, is the same as if the shaft were straight all the way to the curve.

The female jaw has its proximal surfaces concave, G, preventing the calculus from slipping out when the power is applied, and tending as well to drive the calculus lower down, thereby placing it in a position where the instrument gains strength. The female shaft is elliptical and of uniform size from the handle up to within about three inches of the crook; here it begins to increase slightly in caliber until it reaches the maximum which is at the crook (Fig. 4). This results in great strength for the female shaft at the point where it is most needed, and at the same time places the extra metal within the bladder and within the prostatic portion of the urthera only, where it is easily accommodated.

The shoe of the female jaw (M, Fig. 5) is made abundantly larger than the male jaw, so that all débris is expelled, and impaction of the instrument prevented, and the wall of the bladder is thus protected from being pinched or cut (Fig. 5). The female blade is elliptical in cross-section (Fig. 6), in order to give a thick septum, K, to the male blade, and yet not increase the caliber of the shaft (Fig. 6). The female jaw is made thin in a fore-and-aft direction (G, H, Fig. 4), in order to take up less room in the bladder. The proximal surface (P, Fig. 5) of the male jaw is in the form of a wedge of about sixty degrees, in order to penetrate a calculus with the least power propelling it. The cross ridges (R, R, Figs. 4, 5, 6) prevent the stone from flying when broken, and the parallel spillways (S, Fig. 4, 6) permit the débris to escape without causing impaction of the instrument.

Sir Henry Thompson, in his book (*The Urinary Organs*, note 1, page 79), says: "Only slight approximation to the form of the wedge in the opposing surface of the male blade is permissible. If it has an angle, say, of ninety degrees, some danger is incurred. It may be driven through almost any stone, it is true, but the fragments will fly off right and left with prodigious force, even in fluid, and injure the coats of the bladder. Also, when the male blade has the form of a rather sharp wedge, the calculus is seized, and retained with greater difficulty than with a male blade which is less salient."

Perhaps he does not realize it, but after saying the foregoing he has deliberately designed and adopted a wedge in his instrument of less than ninety degrees; in fact, a wedge of forty-five degrees, with no means whatever beyond it to prevent the fragments flying (W, W, Fig. 7). A great deal of the success of his instrument is owing to the sharp wedge, of which he is evidently not aware, for it allows his instrument to cleave a stone with less force propelling it, and when anything is disrupted with a small force the energy stored up in the parts so separated is less, and they will come to rest sooner. The iceman, with a thin-bladed axe, splits the block of ice gently and with ease, and the parts so separated do not fly. What would happen if he used the broad head of an axe?

As regards the alleged difficulty of seizing and retaining a calculus with a sharp single wedge, it is a well-known fact that an uneven object adjusts itself more readily to three points of contact than four. More especially is this true when the three points form apices of a triangle. Moreover, it may be said that out of 184 vesical calculi crushed by this lithotrite in the testing apparatus, not one slipped in the least, except to adjust itself lower down on the female jaw, owing to the concave surface of that member, as already mentioned. I greatly doubt if all four of the opposing edges (W, W, X, X, Fig. 7) in the Thompson lithotrite are at the start in contact with a calculus.

The spur (T, Fig. 4) rises to a great height on the male jaw to give it greater strength. This spur interferes in no way with the holding of the stone.

The great breadth of the septum (K, Fig. 6) of the male blade is permitted by the elliptic shaft.

The handle or screw mechanism belongs to what is known as the interrupted screw-type. It consists of an internally screw-threaded barrel (Fig. 8) having the threads cut away for the entire length of the barrel at alternate spaces of ninety degrees each.

This screw-barrel has an end movement in the cylindrical handle of about one-sixteenth of an inch. Working in this barrel is a pair of screw-blocks, likewise having their screw-threads interrupted at alternate spaces of ninety degrees each. Thus the screw-blocks may be slid up and down the barrel without the threads engaging. When it is necessary, however, to apply the power, the screw-blocks are turned by means of the screw-handle, and the threads engage immediately. One screw-block is rigidly keyed to the screw-handle shaft, and the

other is so formed that it may have a motion of ninety degrees around the screw-handle shaft. Thus, when the screw-handle shaft is turned to the right the screw-block that is rigidly attached to the shaft is brought into mesh with the threads of the screw-barrel, and a further turn of the handle of ninety degrees brings the rotatable screw-block also into mesh. The screw-threads on these two blocks are, therefore, now no longer interrupted, relatively to the barrel, but continuous, and we have in substance a solid plug, or screw-block, engaged with the threads in the screw-barrel. As long as the screw-handle is turned to the right this state of affairs continues, and the male jaw is propelled toward the female jaw. After the calculus is crushed the instrument may again be unlocked and the jaws separated by turning the screw-handle to the left until it stops. This left-hand motion is never more than half a turn. Owing to the sixteenth-inch play of the screw-barrel in the cylindrical handle it readily adjusts itself to engage with the thread of the screw-block, and the calculus is, therefore, never dropped (perhaps after a hard search for it) in locking the instrument. The screw-thread of this instrument has been made slow for several reasons. First, it increases the power of the instrument for crushing, because it brings in the well known and important factor of time in crushing the calculus. A certain pressure may be applied to a stone without crushing it, but if the same pressure is allowed to remain acting upon the stone for a short time the stone will crumble without the addition of further pressure. The slow thread is, therefore, adopted that the stone may have time to break without unduly straining the instrument. The operator is also spared using an

TABLE OF COMPARATIVE EFFICIENCY OF LITHOTRITES.

No.		Kind of lithotrite.		
		Forbes.	Bigelow.	Thompson.
1	Size of lithotrite—French scale	No. 33	No. 33	No. 29
2	Pitch of screw (in turns per inch)	14	4.57	4
3	Character of screw-thread	Single	Triple	Quadruple
4	Diameter of screw-handle in inches	1.625	1.3125	1.3125
5	Theoretical pressure, in pounds, between jaws of lithotrite for one pound in pan of testing apparatus (wheel of apparatus being 18″ in circumference)	252	82.27	72
6	Actual pressure, in pounds, between jaws of lithotrite for first pound in pan of testing apparatus, as registered by dynamometer	42	32	30
7	Per cent. of friction in lithotrite for first pound applied; the actual friction increases by an almost constant increment for increased loads for all types of lithotrites	83.3	61	58.25
8	Constant, for decrease of pressure between jaws of lithotrite, for each additional pound applied to the pan of testing apparatus.	1	0.5	0.5
9	Average crushing resistance of ten plaster-of-Paris cylinders of uniform size. All crushed through same axis to determine the comparative penetrative qualities of the various lithotrites. Actual effort in pounds between jaws	128 64	156.48	147.50
10	Relative penetrative efficiency, due to the form of jaws, as deduced from No. 9, compared with the Forbes lithotrite	1.000	0.822	0.872
11	Actual pressure, in pounds, between jaws of lithotrite for first pound of rotative force applied to screw-handle	11.93	7.34	6.88
12	Constant for decrease of pressure between jaws of lithotrite, for each additional pound of rotative force applied to screw-handle	0.28	0.11	0.11
13	Relative crushing effect of lithotrites on a calculus for first pound of rotative force applied to screw-handle, deduced from Nos. 10 and 11	1.000	0.505	0.502
14	Relative operative strength of lithotrites as deduced from their penetrative efficiency and gross strength	1.000	0.661	0.652 No. 33 F.

TABLE OF COMPARATIVE STRENGTH OF LITHOTRITES.

Kind of lithotrite.	Size of lithotrite, French scale.	Greatest pressure, in lbs., from which lithotrite would recover shape, or remain operative	Ultimate pressure, in lbs., required to bend, break, or make lithotrite inoperative.	Effect of ultimate pressure.	Shown in
Forbes	No. 33	600	650	Female shaft bent down 1¼″ from end; ends of flanges of male jaw slightly torn; instrument can be closed completely and withdrawn from bladder	Fig. 9
Forbes	No. 29	484	525	Instrument this size not tested; figures were calculated and therefore only approximate.	
Bigelow with Forbes male proximal surface and V groove	No 26	345	358	Female shaft slightly bent down 1¼″ from end; female jaw broken through on one side of fenestrum; instrument can be closed and withdrawn from bladder.	Fig. 13
Bigelow	No. 33	483	495	Male jaw snapped off at top of spur with great force, flew 12 feet; locking rods in handle slightly bent; instrument can be closed and withdrawn from bladder.	Fig. 10
Bigelow	No. 29	381	400	Male jaw snapped off at crook with force; female jaw snapped off near top of fenestrum with force; instrument can be closed and withdrawn from bladder.	Fig. 11
Thompson	No. 33	449	472	Instrument this size not tested; figures were calculated, and are therefore only approximate.	
Thompson fenestrated	No. 29	355	382	Female shaft badly bent down 1¾″ from end; screw thread slightly burred; instrument cannot be closed within 1½″.	Fig. 12

NOTE.—The conditions of these tests were identical, and the resistance of the dynamometer was applied between the extreme ends of the jaws. The Forbes and Bigelow instruments were made by Tiemann & Co., of New York, and the Thompson fenestrated by Weiss, of London.

undue amount of strength, for with him it is the old story of 33,000 pounds one foot high in one minute, or one pound 33,000 feet high in one minute. The screw-handle has been made larger than heretofore, because it has been ascertained that any stone will give way before the instrument suited to it is damaged, and a large screw-handle aids the easy and gentle manipulation of the instrument. The shape of the handle is also different, and calculated to serve its purpose. Being made of very thin sheet-metal it is at once strong, and as light as the lightest handle now employed, which is, perhaps, the soda-water-fountain wheel of Thompson or Civiale. I have designed a mechanism which may be placed within the hollow screw-handle, whereby the operator can see what power he is exerting between the jaws of the lithotrite. This mechanism, though it will add a trifle to the weight of the lithotrite, will not increase its size in any part. To sum up this instrument, it may be likened to a chain in which each link is of equal strength, and that means the maximum strength for a given size and weight, or, in other words, a correct disposition of metal.

Messrs. George Tiemann & Co., of New York, will make this instrument, and it is proposed to place this testing apparatus in their workshop, where every instrument, will, before it leaves the shop, be tested to a proper pressure in accordance with its size, and the pressure it has been so subjected to stamped plainly upon the handle. Thus the surgeon may operate with the greatest confidence in his lithotrite, knowing the pressure it has been subjected to and the crushing resistance of the hardest calculus thus far obtained by us, as indicated in the table.

As a final result of this series of experiments, which have been conducted with the utmost care and impartiality, we may draw several conclusions. First, as regards the lithotrite, its shape and action: After seven operations on the living subject it has demonstrated its complete fitness. It has broken a hundred and fifty-eight calculi while in the testing apparatus, and it has been subjected to a pressure of five hundred pounds between the jaws for thirteen times. Its ultimate strength after this trying ordeal was six hundred and fifty pounds, and, moreover, after this enormous pressure the instrument was closed and could have been introduced and withdrawn from a human bladder with ease and without injury to the parts. As regards the calculi crushed to make the table which is before you, it may be stated that the large majority were many years old and much harder than they would have been if only recently taken from a living subject. The greatest resistance offered by any calculus so far encountered by us was four hundred and six pounds. (No. 27.)

FIG. 9.

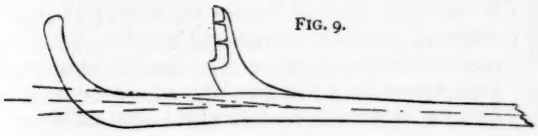


FIG. 10.

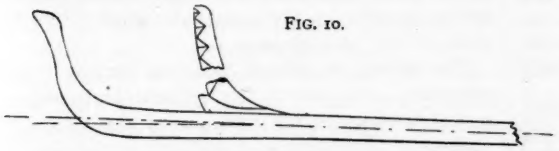


FIG. 11.

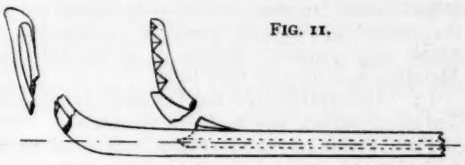


FIG. 12.

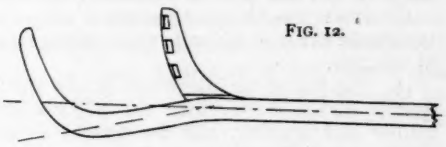
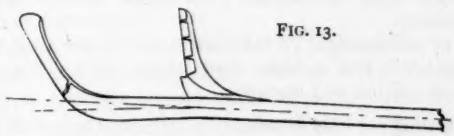


FIG. 13.



SYNOPSIS OF CONSTRUCTION OF THE LITHOTRITE.
READ BY DR. W. S. FORBES.

1. Designed with the view of meeting, first, the anatomical conditions; second, conforming to the laws of mechanics, special attention being given to the economic disposition of material.

2. Double curve, permitting easy introduction, giving greater strength to the female shaft and jaw, and better support to resist side movement of the male jaw.

3. Elliptic cross-section of the shaft, to give greater breadth of septum, prevent side movement of the male jaw, and be of minimum circumference.

4. Angular undercut slot or V groove, to prevent the male blade from rising out of the female shaft and to bind the two closer together under strain.

5. Concave shape of the female proximal surface, to prevent the calculus slipping out, as well as to drive it down to the lower part of the curve and so gain strength for the female jaw.

6. The female jaw made flat in a fore-and-aft direction, to take up a minimum amount of room in the bladder.

7. Large clearance between the outside of the male jaw and the inside of the female jaw, to prevent injury to the bladder, and impaction.

8. All exposed edges gently rounded to prevent injury to the bladder.

9. All internal corners rounded to avoid starting cracks.

10. Shape of the male proximal surface strategic, *i. e.*, best adapted to the more easily penetrate a calculus, to keep fragments from flying and clear itself, to prevent impaction.

11. Plea for the slow thread (strain on the instrument and work done by operator reduced to a minimum and time gained).

12. Plea for the large screw-handle; it is not too large because few men can break an instrument with it; moreover, the instrument as constructed will break any calculus before it is injured itself. Metallic, hollow, and very light.

13. Interrupted screw-mechanism. It is stronger, less complicated, and easier to operate.

14. Cylindrical handle, same size as Bigelow's, and of proper size to allow of holding tightly.

15. Power-recording mechanism in screw-handle, to measure strain on lithotrite and crushing resistance of calculus.

16. The size of the instrument is one and three-quarter inches shorter than the Bigelow of equal caliber and opening, and five-eighths of an inch longer than Thompson's of equal caliber and opening.

17. The weight of this instrument is the same as Bigelow's and a trifle more than Thompson's of equal caliber and opening.

Owing to the kindness of Messrs. George Tiemann & Co., of New York, in executing the thoughts of my son and in following his drawings and models in the various evolutions to the final instrument, which is now brought before you, and in supplying the already existing types of instruments for testing, he has been enabled to carry these experiments to a higher degree of refinement than my purse would otherwise have allowed.

During the crushing of these calculi there were present on various occasions the following gentlemen: Dr. G. M. Gould, of THE MEDICAL NEWS, Prof. Frederick P. Henry, Prof. Harrison Allen, Dr. A. Hewson, Prof. Joseph Hearn, Dr. Charles H. Reckefus, Jr., all of Philadelphia. During the breaking of the lithotrites in the testing machine there were present Professor Orville Horwitz, and Dr. A. Hewson, Demonstrator of Anatomy, Jefferson Medical College.

A word, and I have done—a word, but a necessary one. I know that I incur the risk of displeasing my son in what I am going to say; but, in this body of men and on this occasion, I trust a father may be pardoned for venturing to digress from the injunction of his son.

In the paper I have had the honor of reading every thought, every idea expressed, indeed, the entire habendum of the paper, came from and belongs to my son, Mr. John S. Forbes, mechanical engineer.

1704 WALNUT STREET.

INEBRIETY AS A DISEASE, ANALYTICALLY STUDIED.[1]

BY R. M. PHELPS, M.D.,
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DURING the last year, basing my convictions on the study of nearly two hundred inebriates who have been committed to this Hospital, I presented to the State Medical Society the subject of "inebriety," especially considering whether or not it deserved the name disease. This especial consideration is needful, not to establish or controvert the fact, but because of the somewhat logical deduction drawn from such designation by various writers, and secondarily by the people also as to the "irresponsibility" of inebriates.

The subject is difficult to define because of the symmetric character of the frequent brain-impairment; because of the vagueness of the secondary pathology; and because definitions pushed back to their fundamentals, here sooner than elsewhere, reach the inexplainable. Some of the advocates of the disease-theory have held to me that the subject needs still farther analytic study. The logical conclusions which are drawn from the statement that "inebriety is a disease" comprise the responsibility of action of many hundreds of thousands in this country, and are therefore highly important. I will first quote a few paragraphs from the preceding article mentioned to show the stand there taken.

Speaking of the writings of the Association for the Study and Cure of Inebriety it was said: "The trend of the literature, however, is not so vague, and is quite plainly toward inebriety as a disease of the brain, resembling insanity or constituting insanity. While hesitating to call inebriety an insanity, except in occasional cases, the writers yet hover about this idea as one giving most significance to their statements."

Definition was given as follows: "We might define inebriety, as far as it deserves the name of disease, as including those cases in which the drinking of alcoholic liquors, either from inherited appetite, from inherited predisposition, or from acquired habit, becomes accompanied by apparently uncontrollable impulse or by mental defects, such as *amnesia*, *trance-state*, *transitory mania*, or by the more chronic *dementia*. But this definition merely defines an insanity, so that we tend, as does the current literature, toward making inebriety merely an insanity, having drinking as its most prominent exciting cause.

[1] This article was prepared for the twentieth annual meeting of the American Neurological Association, held at Washington, D. C., May 29 to June 1, 1894, but was not read on account of the absence of the author.

"But, although we have made our ideas far more clear, we have still exceeding great difficulty in making the practical application at hand. For it is hard to say *who* has the mental defect and *when* one's will-power is overborne. Dr. Crothers tries to find these defects in *all* of those who try to use alcohol to excess. He pictures as strongly as he can a kind of dulled moral sense, dulled mental power, and dulled will-power gradually overcoming the victim.

"But even granting that there is dulling of mental and moral keenness in all drinkers, commencing theoretically with the first drink, and increasing proportionately to the amount and duration of the drinking, yet should we not hesitate to call a man insane or irresponsible until signs of insanity are so distinct as to be clearly formulated?"

Concerning the predisposition it was said: "One man has a genius for music, another could not do the same work after a lifetime of study. One man is alert and nervously active, always in action, another slow and steady-footed, and could not by any training attain the genius-like standard of others. In like manner one has that nervous susceptibility that is excited and weakened by alcohol, while his comrades, with the lifetime of habitual association with alcohol, are never drunk. One may possibly call it disease, but as purely a tendency in itself; I can hardly think it a vice or disease, but rather a defective constitutional state. So much for the tendency itself. The habitual yielding to that tendency I should call a *vice*. The diseased condition following, be it mental, physical, or both, I should call a *secondary disease;* if it is mental I should call it *insanity*.

"From the above it will be seen that the yielding to the habit-element is on exactly the same plane as yielding to swearing or pernicious habits of any kind."

A study of the present attitude of the profession reveals something like this: *The Journal of Inebriety* and occasional articles elsewhere by the same class of writers, prominent among whom have been Crothers, Kerr, Wright, Mason, Hughes, and Parish, hold, though in varied meanings, that inebriety is a disease. The prominent neurologists of the country have hardly well defined their position, the subject being somewhat neglected. Dana, in two or three articles, has seemed to call for more conservative views, and has set forth distinctions tending to exhibit the fallacy of classing all inebriates alike.

So many disputes of the past have depended upon differences in meaning attached to the same word that we begin first with definition. "Inebriety" may have four stages: First, taking first or occasional drinks; second, drinking to produce tipsiness or occasional drunkenness; third, drinking to excess, which means frequent and habitual intoxication; fourth, drinking, seemingly uncontrollable, with occasional periodicity of manifestation.

This division is one of degree, and we hold is better than one of "amount drunk," or "duration of habit," or "purpose in drinking."

Now it will hardly be contended that the first stage is a disease, rarely that the second is a disease, while stages three and four, especially the latter, seem to be most frequently meant by writers, though unfortunately they do not often so limit their meaning.

But before going farther we must also define "disease." In looking over writings we find that disease is used to mean usually, 1st, a clinical entity exclusive of other entities, such as measles, smallpox, rheumatism, etc.; but that it is occasionally used to designate, 2d, a more subordinate element or symptom, such as pain or headache; and again a little differently it may mean, 3d, groups of mental symptoms which are thought to have special lesions, though these may not be demonstrable. Defects or neuroses are *not* usually called diseases.

By "habit" we may refer to actions, which by repetition have become far more apt to be reënacted than those not so repeated. The action so designated may have first, only the *mental excitement* or incitement, as in swearing or lying; or secondly, it may have also a *physical craving*, natural or induced, which shall make it more binding. Smoking has a small and vague amount of this physical element, but drinking has a quite large amount. The habit part does not cease, however, because the physical craving comes in.

By "vice" we mean an action or habit which in the judgment of the one acting has evil tendencies. It is a matter of difference of judgment at times, whether a special act is a vice or not (for example, smoking).

Now with our terms defined, what is inebriety, "vice," "habit," or "disease"? May not inebriety be any or possibly all? The first drinking could hardly be a disease; it has hardly become a habit, and it is a vice only if the evil is recognized as such by the drinker. In the second stage it is probably becoming a *vicious habit*, while in the the third or fourth stages the habit seemingly grows stronger and is bound by induced physical failure which had been gradually invading the system. This outlines the *ordinary* case.

Let us separate inebriety into still finer elementary parts. Inebriety may be *caused by* insanity. It is then merely a symptom of an unstable mind, and is the true irresponsible state, though not a disease *of itself* then.

Again, inebriety may be caused by a physical disease, not in any mysterious way, but to relieve pain

or depression. The physical disease then is a temptation. Again, inebriety may induce mental disease. This seems sure, as there is a quite distinct degenerative type so produced. But, is not such mental disease secondary—just as a pneumonia would be secondary to exposure to cold? Frequently the preceding causation cannot be clearly outlined, and the forms are mixed, but the principles remain the same.

But, it will be said that we have left out of our analysis the "hereditary" cases; the "uncontrollable" cases, and the "periodical" forms. As regards heredity, I have not among two hundred of the worst cases in the State seen any marked cases of *direct* heredity. But, by heredity is usually meant the inheritance of defective nervous make-up, which may in the descendant bring epilepsy; or excess in appetite; or mental disease, etc. Of this *indirect* heredity there are a considerable number of cases. This was quite thoroughly brought out in an article by T. D. Wright, that prolific writer on inebriety. In this we believe thoroughly, and have many examples. This kind of heredity, however, only increases the tendency. It only makes the habit more easy. It does not truly constitute any disease, any more than tuberculosis in the parent makes the son diseased. It simply makes disease easily acquired. We all have more or less of tendency or neurosis toward one disease or another, and though by microscope or scalpel we cannot find predisposition, we do not deny its existence.

As regards "uncontrollableness," the appetite grows surely more and more strong, but it is a little rash to say that it is *fully* uncontrollable unless the man is insane. By the study of cases under the restraint provided here, I have come to think that they have always some control left; although the pitiless surety of chances that they will again drink if free is remarkable. I would, then, personally deny absolute uncontrollablenes, and admitting an approximation would not admit it to be a disease-entity, but only symptomatic of both the habit and the natural or induced nerve-changes, and instability of nerve or brain.

"Periodicity" is a mysterious element, which has ever been regarded as clinching the disease-argument. But if we study periodicity by itself we find it prominently in insanity in from one-eighth to one-fourth of all cases. We find it in epilepsy, migraine, malaria, and in the physiologic function of menstruation. Nay more, there is in most diseases a tendency to spontaneously recede and the liability to another attack.

Periodicity in its extreme form in inebriety has not been seen in much more than 2 per cent. of the cases here. In modified and irregular forms, hardly noticeable as periodic, it is seen in a good many more. But at any rate, admitting its mysteriousness, I am inclined to consider it only one sign of a neurotic or nervously unstable temperament; and whether it appear in migraine, epilepsy, insanity, or inebriety, to be the same in kind, and in the latter to be an accompaniment of the drinking rather than any element of it. The periodicity in some cases I have studied was inherent in nervous instability, in the neurasthenic attacks, or whatever they may be called, which in turn induced the drinking. It was a physical or emotional state which recurred. The inebriety followed if opportunity offered as an element of relief for the nerve-unrest.

We have now considered most of the elements entering into inebriety. In none of these forms is inebriety (drinking) a disease-entity, though it is in some a disease-symptom, and in many or all the cause of impairments of nerve or brain, which in the end may be grouped together with other bodily impairments, and designated as a disease, called inebriety.

It remains now to try and make our meaning a little more clear by noting the steps which a drinker successively takes. He takes a first drink; the reason is probably a mixture of sociability and desire of emotional excitement. If of unstable nerve-condition it affects him much; if more normal, but little. He repeats the act at various times, and finally becomes drunk. This is to him simply an undesirable ending, the emotional and nerve-exaltation and the sociability being still the ends sought. Habit, as everywhere holds its power, and a strong craving is at times recognized. Years pass, and so many times and so frequently has intoxication occurred that it is called uncontrollable. The nerve-instability, if not originally present, has been induced. The emotional exaltation and social pleasure are but a flicker now. But the nerve-depression to which he sinks *without* any sustaining liquor, are now the main elements he flees from.

In this the worst case, has habit gone? Has vice gone unless the man be definitely deserving of the name insane? Judging not from the inebriety, but from the ordinary evidence, I hardly think so; though I can readily see that they have sunk to a subordinate place.

For complete answer as to sanity, we can judge only by placing the man in favorable circumstances, and away from drink; if then insane, so judge him. If not, then do not call him so, nor infer that he is so, because of inebriety. My concluding point, thus is, judge of insanity or irresponsibility by ordinary rules, and not by the fact of inebriety.

In conclusion I quote a paragraph from a previous writing, concerning the ordinary inebriate state:

"Some years ago I watched and cared for some

morphin-eaters through the agonies of abrupt withdrawal of morphin. What I witnessed then I called intense unrest; an intense hunger of the nervous system for support. It is this hunger and unrest in kind, I think, that comes on many inebriates paroxysmally, and impels them to drink. It is to a degree a neurasthenic state. Nor do I think it peculiar to inebriates. The exhaustion of mental labor without exercise seems allied to it. The nervous system blindly hungers for something to brace it up, which the liquor temporarily does. This admits, of course, the existence of a gradual impairment of nerve or mind from drinking; theoretically, it is, perhaps always present, as some seem to claim."

"Practically we are obliged to speak of inebriety as having a tendency toward such impairment, sometimes observable, at other times not."

The preceding discussion would be of little value if disease were not held by the writers of the only medical inebriate society in this country to be to a certain degree synonymous with irresponsiblity. With this in mind, clear ideas assume vast importance. We have not discussed the pathology of alcoholism, as it is to a great extent secondary, like that of other secondary diseases.

We hold that physical or mental cravings (temptations) are not to exclude habit or intent any more in inebriety than in sexual excess, in criminal life, swearing, smoking, etc. Whether the habitual burglar is any less criminal because of his habitual practice than in the first act of burglary, it is hard to say. The law usually holds him more rigidly, but it does so for society's safety, rather than on account of any idea of the person's increasing responsibility. I would grant freely grades of responsibility, but would think human judgments and human laws not perfect enough as yet to allow for them. I would consider insanity from alcoholic origin as of slow growth. In most cases it passes slowly the arbitrarily adjudged lines between sanity and insanity. Moreover, it is usually of that symmetric type of failure that is so little noticed at first and so hard to define.

In order to show the standing of the disease-advocates as truly as possible, we quote one of the latest and clearest of their statements.

The *Journal of Inebriety*, October, 1893 says: "Inebriety is a psychopathic disease, and no theories which assume a degree of health up to a certain border line, and disease beyond this, are of any value. We have persistently urged the full recognition of inebriety as an organized, progressive degeneration. All half-vice and half-disease theories mean faith-cures and hospitals, pledges and specifics, drugs and punishment, as means of cure and treatment. The term inebriety must be recognized in the same way as insanity is, and be used to designate a disease in which the use of narcotic drugs is a symptom."

We can answer best this view by stating our own.

First. We do recognize inebriety (meaning the resulting condition) as a disease, in much the "same way" as insanity. As far as judging whether it be a disease or not, and as far as thinking of both in many cases as gradually growing impairments, we do, but not as regards their origin. It would seem if ever there was a vice, it was in the first drinking; provided of course its hurtful nature is known.

The disease inebriety (meaning again the varying and complicated combinations of effects produced by drinking) has been compared in its origin to that of lead-poison. Each would be a "progressive" impairment, initiated and increased by repeated acts, in the one case vicious, in the other not. Neither would be called a disease in the first contact with the poison. Each would be called disease when a combination of well-defined symptoms appears.

Second. That inebriety is an "organized progressive degeneration" we would amend by substituting the statement th at *progressive inebriety* (progressive drinking) *produces progressive toxic degeneration*, which affecting the whole nervous system may show itself most in the brain in the form of insanity, or most in various peripheral symptoms. We would think of its action in accordance with Strümpell's views as summarized in the *Journal of Mental and Nervous Diseases*. Speaking of delirium tremens and heart-failure, he says, "they are due to a summation of minute toxic effects, just as wrist-drop and epileptic seizure are due to the summation of exceedingly small quantities of lead absorbed daily. The toxic effects of alcohol, a readily oxidized substance, cannot be due to an accumulation of toxic material, but a change of structure resulting from its chemical action on nerve-tissue. From an insignificant alteration, a chronic pathological condition gradually results. Comparatively small amounts of alcohol taken regularly and habitually are as effective as an oft-repeated, severe, acute intoxication. As in other acute and chronic intoxications, there is a pronounced difference of individual disposition to the action of alcohol, and undoubtedly a different individual disposition of the internal organs also exists. Alcohol, like most other poisons, attacks the nervous system first."

Third. The assumption of a border line between disease and health is not only not mysterious, but something we as physicians have to do in almost every case. Few insanities come on with even approximate suddenness. In few cases can the exact day or week of beginning be ever ascertained. What matters it if the day of beginning of locomotor ataxia is never known? That imaginary boundary line between health and disease was passed *somewhere*, and

it is true and just to assume some time of beginning arbitrarily.

Our conclusions, then, would be something as follows:

1. We should, for the sake of clearness, not mingle or use interchangeably the words inebriety and irresponsibility; but in the cases in which it can clearly be shown to exist, we should make inebriety mean the drinking, and irresponsibility the insanity so produced.

2. Disease should not be carelessly used to mean predisposition, or neurosis; nor should it be used to mean a disease-symptom unless so specified. But when unqualified it should designate a fairly well defined entity composed of a group of symptoms with known or presumed pathology and causation.

3. Inebriety (excessive drinking) can then be stated to be not a disease, but as tending to produce various diseased conditions.

These diseased conditions are quite general in character, but most notably seen in nerve-failure and brain-failure.

4. The predisposition varies in different persons and constitutes a temptation.

5. Irresponsibility is of varying grade, and the law does not necessarily follow these grades, but adjudges penalty—first by the consequences of the act, and secondly for the safety of society.

6. In our opinion none of the early degrees of inebriety as a rule produces sufficient effect to be named disease or irresponsibility. This being true, even if there be a growing mental impairment, we would call the mental state insanity only when it would be so called if induced by other causative conditions.

Insanity as a disease is also subject to this same rule. The name is not applied to all mental changes, but only to those which have a considerable definition. Multitudes of mental impairments are not called insanity at all.

CLINICAL MEMORANDUM.

INTESTINAL ANASTOMOSIS.[1]

BY W. T. DODGE, MD.,
OF BIG RAPIDS, MICH.
PHYSICIAN AND SURGEON TO MERCY HOSPITAL.

THE following case was under the joint care of Dr. J. L. Burkhart and myself:

Gunshot wound of left wrist and abdomen; fecal fistulæ of ileum and colon, both closed by intestinal anastomosis with Murphy buttons; recovery.—E. McM., aged nineteen, was admitted to the Mercy Hospital, October 20th, 1893. The previous day, while hunting, he had climbed on top of a stump, and the gun slipping from his hand had been discharged, the contents passing through the anterior portion of the left wrist and entering the abdominal wall just above the crest of the ileum. Nothing had been done for him, and as he was very weak from the loss of blood and the fatigue of a long journey, we made no attempt to dress the wounds that night, but administered stimulants freely and secured rest with morphin. The following morning, his condition being much improved, an anesthetic was administered and the wounds thoroughly cleaned. The tissues of the wrist and abdomen were badly burned by the powder, and the entire charge of the gun was found in the abdominal wall, the greater portion of it resting against the peritoneum. The shot removed were of all sizes, from fine birdshot to buckshot, and altogether a good sized handful of wadding and shot was obtained. No evidence could be obtained that the peritoneum had been perforated, but the membrane was bruised and blackened by the contact of the foreign bodies. We satisfied ourselves with thoroughly cleaning the wounds, clipping off bruised tissues and establishing drainage. The young man experienced much pain in the abdomen for several days, when it was relieved by a discharge of fecal matter from the wound. At first only a portion of the feces came from the wound, a natural movement of the bowels taking place occasionally, but as the quantity escaping from the wound gradually increased and he was constantly soiled by the discharges we concluded to attempt closure of the fistula. The first attempt was made October 28th, but was a failure on account of the friable condition of the intestines. There were two fistulæ, one in the sigmoid flexure of the colon and one in the ileum. The gut-walls were covered by granulations, and suturing was impossible. We discovered an intraperitoneal abscess, however, evacuated the pus, and established drainage. Two weeks later, the suppuration having ceased, another attempt was made to close the fistulæ. We sewed up the intestinal openings without liberating the adhesions, being desirous to avoid additional contamination of the peritoneum. In two days the sutures sloughed out and the condition was worse than before. Two weeks later, or about December 1st, a third attempt was made to close the opening in the small intestine by suture, leaving the opening into the colon as an artificial anus. The walls of the intestine were found to be in a softened condition and to tear when an attempt was made to introduce sutures or to separate adhesions, and, the patient being in a feeble condition, the attempt was, for the time, abandoned. Our efforts were now limited to general supporting treatment and to maintaining cleanliness, an exceedingly difficult matter on account of the constant discharge of liquid feces from the small intestine. The man was, in spite of the free use of protective powder, constantly excoriated from the contact of this irritating discharge. A month of this sort of thing brought us to the determination to close the opening in the small intestine or close the patient's earthly career, and on January 2, 1894, with the assistance of Dr. Griswold, we undertook the final operation on the small intestine. The tissues were found to be in better condition than they had been a month previously, and the adhesions binding the small intestine to the abdominal opening were easily separated. The hole in the intestine was found to be so large and the portion of the bowel around it was so friable that we concluded to cut out the

[1] Read before the Michigan State Medical Society, March 3, 1894.

portion of gut containing the opening and make an end-to-end anastomosis. This was accordingly done by means of the Murphy button, the largest size of the regular set being used. The procedure occupied a quarter of an hour. The peritoneum was irrigated and the bowel returned to the abdominal cavity. The colon was stitched into the abdominal wound to close the opening and establish an artificial anus. The patient had no bad sysmptoms after the operation, gained rapidly in strength, and on the eighth day the button escaped from the artificial anus. By February 1st, the patient having become strong and able to walk about the ward, we determined to attempt to close the artificial anus in the same manner that had proved so successful with the small intestine. Truax, Greene & Co., of Chicago, made for us, after specifications furnished by Dr. Murphy, a special size button with a diameter of one and half inches and a central opening of seven-eighths of an inch. February 16th, assisted by Drs. Griswold and Dockry, we separated the adhesions binding the colon to the abdominal wall, and liberated intra-peritoneal adhesions for several inches on either side of the fistula. Four inches of the gut were then removed and the ends joined together by means of the large button. The patient delayed us a great deal by persistent vomiting, but the operation was completed within an hour. As the small intestine appeared in the wound we examined it carefully and located the site of the former anastomosis by means of a band of adhesion. No difference whatever could be discovered in the appearance of the intestine at that point. The caliber was the same as it was at contiguous points, and it was only by the presence of the band of adhesion that the anastomosis site was located at all. The abdominal wound was drawn together as much as possible and a drainage-tube introduced. The patient was kept on a liquid diet and laxatives administered daily. The only complaint he made was on account of the liquid diet, as he had a strong desire for more substantial food, and on the morning of the 7th day I had the pleasure of extracting the button from the anus. A few days later, by means of a flap-splitting operation, we closed the abdominal wound completely. Healing occurred rapidly, and on March 26th the patient was discharged.

MEDICAL PROGRESS.

A New Method for Reduction of Fractures of the Lower End of the Radius.—At a recent meeting of the Philadelphia County Medical Society, DR. T. S. K. MORTON described a method of reducing fractures of the lower end of the radius that he has found satisfactory during a number of years.

The surgeon stands in front of the patient, and interlaces his fingers beneath the supinated wrist and palm of the injured member, so that his two index fingers lie parallel, crosswise, beneath the lower end of the upper fragment of the radius. The palms of the surgeon's hands are then closed in upon the thenar and hypothenar portions of the patient's hand respectively, while the surgeon's thumbs rest parallel, lengthwise, upon the upwardly displaced lower fragment of the radius. The parts are thus firmly grasped by the surgeon while the following movements are made: The patient's wrist is excessively extended by carrying his hand upward. When hyper-extension has thus been secured the surgeon makes powerful traction upon the wrist in the line of hyper-extension. While this traction is maintained the hand is suddenly carried into full flexion, and at the same time powerful downward pressure upon the upwardly displaced lower fragment of the radius is made by the surgeon's thumbs, opposed by the interlaced index fingers beneath the lower end of the upper fragment.

The excessive extension of the first portion of the movement loosens or disentangles the displaced lower fragment, while the subsequent traction, flexion, and direct thumb-pressure force the lower fragment into proper position. A separated epiphysis of the lower end of the radius is likewise easily reducible by this manipulation. For comminuted or complicated or very oblique fractures extension and molding alone are called for in most instances.

Anesthesia is unnecessary for making a single effort at reduction by the proposed method. The patient does not anticipate what is coming, the two movements are made with lightning-like rapidity in a small fraction of a second, and in nearly every case perfect reduction has been accomplished before the patient realizes that he has been hurt. Should the manipulation fail to secure perfect reduction at the first attempt, anesthesia had better be induced, for the pain of repeating the maneuver would be intolerable.

In cases older than one week, with displacement persisting, anesthesia is induced before any effort at reduction is made. The manipulation will often be found to be the best means of performing both refracture and reduction.

For making a diagnosis a modification of this method is most useful. If the surgeon will take the hand and wrist in which fracture is suspected into his hands, as described, and, while the thumbs press firmly upon the lower end of the radius or first row of the carpus, make a series of gentle, quick, short flexions and extensions of the joint—rocking it through an arc of perhaps 25° or 30° above and below the forearm as a horizontal plane—he will be astonished at the ease with which crepitus of the bones of the joint and of any small or large bony or cartilaginous fragment will be elicited. And, best of all, the diagnosis of these obscure fractures about the wrist can thus, after some practice, be brought out without giving unbearable pain to the patient.

Vaginal Hysterectomy in a Woman Sixty-six Years Old.—LAWRIE (*British Gynecological Journal*, February, 1894, p. 385) has reported the case of a woman, sixty-six years old, who for about a year had suffered with pain in the region of the uterus and a vaginal discharge. The latter had at first been muco-purulent, but had subsequently become bloody. The menopause had occurred at the age of fifty. The uterine cervix presented a catarrhal condition. A sound entered the cavity of the uterus for the normal distance; its introduction was followed by slight hemorrhage. On bimanual examination the uterus was found to be somewhat tender but quite movable. Upon dilatation of the cervix an indurated, nodular mass was found occupying the upper part of the uterine cavity. By means of a curet this was

thoroughly scraped away, and the surface left fairly smooth. This operation was followed by great relief, the discharge disappearing and the pain ceasing. The patient gained in health and strength, but in three months the symptoms had returned with their previous intensity. The uterus was again dilated, and the growth, which had attained greater size than before, was a second time thoroughly curetted. There was again temporary improvement, but at the end of six weeks the old symptoms began to return. The growth had returned, and it was determined to make the removal as thorough as possible. With a strong curet the growth and underlying tissues were completely scooped out, till almost the whole thickness of the uterus at that part had been removed. Severe constitutional symptoms followed, but the result was satisfactory for four or five months. The pain then recurred in a severe form, and was attended with considerable hemorrhage. It was now determined to remove the uterus through the vagina. As the woman had never borne children the operation was attended with no little difficulty. The removal was, however, finally accomplished, and the after-history was entirely uneventful. Upon histologic examination the new-growth, which was a sessile tumor of the posterior wall of the uterus, proved to be an epithelioma.

The Amount of Nitrogen contained in the Red Blood-corpuscles in Health and Disease.—VON JAKSCH (*Zeitschrift f. klin. Medicin*, B. xxiv, H. 5, 6, p. 430) has determined that the amount of nitrogen contained in 100 grams of moist red blood-corpuscles in health equals 5.2 grams, corresponding to 34.5 grams of albumin; during and following acute diseases the average rises to 5.80 grams of nitrogen, corresponding to 36.81 grams of albumin; in the course of chronic diseases that do not lead to anemia almost the same figures prevail as during health: 5.56 grams of nitrogen and 34.75 grams of albumin. All secondary anemias, as well as leukemia, lead to a diminution, a *hypalbuminæmia rubra*. The same relation is found to exist in chlorosis, though in a more marked degree. Pernicious anemia, on the other hand, in its last stages leads to a distinct increase in the amount of nitrogen present in the red blood-corpuscles, 100 grams containing 6.48 grams of nitrogen, corresponding to 40.5 grams of albumin—*hyperalbuminæmia rubra*.

THERAPEUTIC NOTES.

Recovery from a Large Dose of Tartar Emetic.—PERRY (*Birmingham Medical Review*, vol. xxxv, No. 189, p. 291) has reported the case of a man, twenty-seven years old, who mixed for himself what he believed to be an effervescent draught. Being thirsty, he drank the mixture before he noticed that it had a peculiar taste and did not effervesce. He then discovered that, instead of sodium bicarbonate, he had taken tartar emetic. He passed his finger down his throat, and succeeded in inducing vomiting fifteen minutes after he had swallowed the poison, keeping up the vomiting with draughts of warm water. In half an hour purging began, and some time later the man was found in a semi-conscious condition in the water-closet. His skin was bathed in cold perspiration; he was almost pulseless, and could not be made to answer questions. He was at once carried to bed, and hot bottles and blankets were applied. Strong tea and brandy were given, followed by decoction of oak bark in considerable quantity. The man soon rallied and became able to answer questions. He vomited three times after having been put to bed, and from the bowels there was continually passing thick mucus having the appearance of boiled sago. There was much complaint of thirst. The purging continued for twelve hours, but neither in the stools nor in the vomit was there any blood. There were cramps in the legs and feet, subsequently becoming general, and being most distressing in the situation of the diaphragm and in the muscles of the neck. For a time the man was almost unconscious and nearly pulseless, with the extremities and the surface of the body cold, and he was apparently dying. The administration of stimulants, however, produced a good effect, and improvement now gradually set in. On the day after the accident the man passed half a pint of coffee-colored urine, being the first since preceding day. After this the urine and stools became normal. For three days there was complaint of general stiffness, especially across the abdomen, with an undue readiness of fatigue, but without further inconvenience. It is estimated that the amount of tartar emetic taken was not less than 200 grains.

Quinin Locally in the Treatment of Blennorrhagic Ophthalmia.—Having by an inadvertence used a solution of quinin by injection in the treatment of a case of gonorrheal urethritis, and obtaining good results, REICH-HOLLENDER (*Archives of Ophthalmology*, vol. xxiii, Nos. 1, 2, p. 30) was led in the treatment of a troublesome case of gonorrheal ophthalmia to use the same agent, in conjunction with ice-compresses and applications of solutions of argentic nitrate, and with equally good results. Further investigation showed that the gonococcus of Neisser was destroyed by solutions of quinin. It is recommended that quinin be dissolved by hydrochloric acid, and in the following proportions:

Quininæ sulphatis	2.
Acid. hydrochloric. dilut.	0.75
Aquæ destillat.	180. —M.

Ft. solutio.

S.—Shake well, and use as an eye-lotion every hour.

Frictions of the Feet as a Resuscitating Measure.—URBASCHEK (*Hygeia*, 1893; *Memorabilien*, xxxviii, 3, 172) has reported the case of a small, corpulent man of advanced years, with fatty heart, who suddenly lost consciousness following some excitement, collapse virtually ensuing. Other measures of resuscitation failing, and the condition becoming alarming, the lower extremities were thoroughly rubbed with cloths wrung out of fresh water. Feeble respiratory efforts soon returned, and these were followed by deep respiration, together with the resumption of consciousness, and the condition of weakness was overcome by means of a general cold rubbing.

For Urticaria.—

℞.—Liquor calcis.
Aquæ laurocerasi } . . . āā f℥j.—M.
Glycerini }

S.—Apply topically and cover with cotton-wool.

Med. Press and Circular.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

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SATURDAY, JUNE 23, 1894.

THE TEACHING OF CHEMISTRY IN MEDICAL COLLEGES.

THE MEDICAL NEWS has been severely taken to task for its position in regard to the teaching of chemistry in American medical colleges; nevertheless, the subject is one too important to permit us to be silent until the reform we seek to bring about is an accomplished fact. Let one who doubts the truth of our strictures ask thoughtful clinicians among the younger generation of leaders—we say younger generation in order to confine observation to a period recent enough to be properly the subject of comment—wherein they feel most keenly the deficiencies of their training. We venture to assert that seven out of ten will answer, "in advanced chemistry." They will confess, if they are honest, that they are not only unable to participate in, but are sometimes hardly able to follow, recent studies in pathology and therapeutics; that the whole subject of infection and immunity is for them beset with unnecessary difficulties, simply because they have not been properly grounded in organic chemistry.

Nor are the majority of recent graduates—even yesterday's graduates—much better off. The kindergarten chemistry-lectures, supposed in many medical colleges to be all-sufficient for graduating classes, are not up to the standard that should be exacted for admission to the first year's course; and even in some of the otherwise first-class colleges the time devoted to physiologic chemistry and pathologic chemistry is ridiculously inadequate.

The truth is that old superstitions as to what constitutes a liberal education have hampered even scientific institutions. The knowledge of books and of men who have written books is a liberalizing knowledge, but the knowledge that is required by a physician is not so much of letters as of things. Physics and chemistry, general biology, and even considerable geology are absolutely necessary before the science of medicine can be approached. The art of medicine can be learned in a fashion without these—and also without languages. Hitherto our medical schools have been—not unjustifiably—exalting the art of medicine, and hence the faulty organization of many of them. But the day of higher education and of exact research has dawned—and the schools that desire to keep high rank in the new day cannot stop with half-way measures. Physics and inorganic chemistry must be made preliminary requisites. General organic chemistry must be taught thoroughly during the first two years, in the laboratory, by a sufficient number of competent teachers, and for hours at a time, not for occasional minutes. The junior class must devote a sufficient time to physiologic chemistry, and the senior class study pathologic chemistry and be trained in methods of original research. Post-graduate courses must be organized for those who desire to continue these studies. The immediate future of medical science demands accurate and extensive chemic knowledge, and if American schools do not give it, American physicians will be left far in the rear. It is true that all cannot be done in a day, but a beginning can be made at once. The first practical step is to abandon the elementary lectures now given to first-year and second-year classes in medical colleges, and insist on a knowledge of general chemistry as a preliminary qualification. The rest will follow.

SWEAT-SHOPS AND DISEASE.

A RECENT investigation made in this city developed the fact that in some of the worst "sweat-shops" garments were being made for many well-known establishments. These garments were often of the best quality, and not, as is usually supposed, only cheap goods. A sweat-shop is synonymous with all that is filthy and unsanitary. In it the workmen are crowded together, and no factory-laws

regulate the manner of work. It often is also the living-room and sleeping-room of the family. The children, healthy or unhealthy, commingle with the workers and come in close contact with the materials. Diphtheria and other contagious diseases are very prevalent in the "sweaters' section." Often the Board of Health is informed only when a death occurs.

A quarantine means much to these poor people, and they have rather profanely nicknamed our sanitary agents the "Board of Hell." My lady's silk-waist or my gentleman's dress-coat may form a pillow for some sick child (not altogether a bad use for it), and herein lies the risk, particularly to the children in the families of those who receive articles of apparel made under the conditions stated.

If a proper popular sentiment were created, our wealthy merchants would be compelled to have their own shops, in which their goods would be manufactured under proper conditions. As it is, they are not bothered by factory-inspectors or by strikers, and are not obliged to go to the expense of rent, equipment, etc., but a contractor or middleman calls for the work and distributes it among his sweaters and guarantees the return of the manufactured article. It is simply a matter of convenience, and for the merchants' convenience his patron must run the risk of contracting disease.

The workmen are compelled to live under most unsanitary conditions, and in the end entail an expense on the city in the increased amount of disease. Besides, child-labor is called into use, which under existing factory-laws could be prevented, but which cannot be reached in sweat-shops. The subject is in every aspect a most important one, and well deserves the attention of sanitarians as well as sociologists.

The sweating system is spreading. At first it was in the hands of the Russians; now the Italians are taking it up, and whole blocks are given over to it. We trust that the medical profession will take some united action in the matter and so arouse public opinion that, for their own advantage, our prominent merchants will condemn "sweat-shop work" and do their own manufacturing.

EDITORIAL COMMENTS.

The American Pharmaceutical Association has issued a circular detailing the aim of the Association as the union of the educated and reputable pharmacists and druggists of America in the following objects:

1. To improve and regulate the drug-market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home-adulteration.

2. To encourage proper relations between druggists, pharmacists, physicians, and the people at large, which shall promote the public welfare and tend to mutual strength and advantage.

3. To improve the science and art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug-business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

6. To uphold standards of authority in the education, theory, and practice of pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

To all of which we most heartily assent, but we would supplement these worthy endeavors with yet three propo-propositions, viz.:

8. *To suppress counter-prescribing.*

9. *To suppress the unauthorized renewal of prescriptions.*

10. *To discourage the sale of secret nostrums.*

The Summer Care of the Children of the Poor.—A most commendable and praiseworthy enterprise, which should especially receive the encouragement and support of the medical profession, has been undertaken by a number of public-spirited and philanthropic citizens of Philadelphia, with the end of furnishing to poor families, virtually or actually at cost, sterilized milk, pure milk, and infants' foods. As is but too well known, the summer diseases of children and the frightful resulting mortality are due to improper food and clothing, intense heat and unhygienic surroundings. The most important of these is without doubt the improper character of the food, and it is the object of the Philadelphia Sterilized Milk and Ice Society to eliminate as far as possible this prolific source of disease and death. For the present there will be but one depot, and that in a district in which a large number of poor people reside, but the establishment of others is contemplated if such funds can be raised. The Mayor of the city, Mr. Stuart, is the President of the Society, and Mr. Philip Lewin is the Treasurer. The Rev. J. Leonard Levy, who has been most active in the movement, is the First Vice-president and the City Treasurer, Mr. McCreary, is the Second Vice-president. A similar enterprise has been for some time in successful operation in New York.

Through the courtesy of the Board of Health, the Society will be furnished with disinfectants, to be distributed where they will do the most good.

The Prevention of Tuberculosis and the Prevention of Smallpox.—We have on several occasions pointed out the wisdom of establishing a hospital for the treatment of tuberculosis. The prophylactic utility of vaccination is too well known and too universally admitted to require comment here. The Pennsylvania State Board of Health, at a recent meeting, adopted the following timely resolutions:

Resolved, That it is the sense of the State Board of Health of Pennsylvania that the time has come when the State should provide hospital accommodations for persons suffering from pulmonary tuberculosis in the case of those who cannot be properly cared for in their own homes, and who through carelessness might be dangerous to the community at large. It is believed that the establishment of such hospitals might be of great value in educating the people.

Resolved, That it is the sense of the State Board of Health of Pennsylvania that all inmates of prisons, reformatories, almshouses, hospitals, schools and other public institutions be vaccinated immediately on admission.

This action is in the spirit of progressive and preventive medicine, and should be the precursor of legislation looking to the enforcement of the views so well expressed.

For Higher Medical Education.—The New York College of Dentistry has set a worthy example in higher education that such medical institutions as have not yet raised their standards of preliminary requirements and lengthened their course of study may well emulate. The college announces (1) a prospective, yearly advance in the preliminary educational entrance-requirements, the details of which are explicitly set forth; (2) a prospective, yearly lengthening of the lecture-sessions—that of 1894–95 to six months, that of 1895–96 to seven months, and that of 1896–97 to eight months; (3) the requirement of evidence prior to graduation of three years' actual study and practice of dental surgery, inclusive of attendance on three lecture-sessions in separate years; (4) the inauguration during the lecture-session of 1894–95 of graded courses of practical work in sub-classes, for the classes of the first, second, and third years, respectively. The further announcement is made that the purpose of the institution is to educate men to practise dental surgery as a special branch of medicine; therefore, the curriculum includes the fundamental departments of medicine, with dental surgery and oral prosthetics.

CORRESPONDENCE.

POTASSIUM PERMANGANATE AS AN ANTIDOTE TO MORPHIN.

To the Editor of THE MEDICAL NEWS,

SIR: In the *Journal of the American Medical Association* for May 19, 1894, p. 755, an editorial entitled "Permanganate of Potassium as an Antidote to Morphin" contains the following as its closing paragraph: "A new antidote to morphin was not urgently demanded, and it could not, in fact, be truthfully denominated as a 'long-felt want,' since the treatment already in general use is very efficient and, as a rule, successful. But even allowing some usefulness to potassium permanganate as an antidote, when swallowed immediately after morphin has been taken into the stomach, this will not warrant the assumption that in such cases its hypodermatic administration will have any beneficial effect. Certainly, we are not warranted at this stage of the investigation in abandoning our well-known physiologic antagonists in the treatment of poisoning, either by morphin or by opium or its preparations. When a human life is trembling in the balance and fatal coma is threatening, it would be criminal to lose time by experimenting with therapeutic novelties, to the exclusion of the established treatment, and the 'rejection of the accumulated experience of the profession.' Some might be led to do so, however, were no word of protest raised against the implication that the suggested treatment is a safe and efficient substitute for the approved methods already in use."

It is scarcely a debatable question if suffering humanity is ever poorer for the discovery of any new method for the amelioration of even the least of those innumerable ills to which flesh is heir, even if that method be only within the reach of a favored few, as compared with the multitude beyond the pale of its relief-bearing influence. And when a measure is proposed whose adoption under certain conditions (as has been undoubtedly shown) means the actual saving of human life which must surely have been sacrificed had "the treatment already in general use" for those conditions been persisted in, shall it be denied consideration at our hands, because, if it shall demonstrate its claims as a valuable antidote to opium narcosis, "it necessarily means the rejection of the accumulated experience of the profession?" Does it not seem incredible that, in the face of undoubted instances of the great value of potassium permanganate in cases of extreme opium-narcosis, any should be found willing to oppose it on such puerile grounds, or be desirous of prejudicing the minds of the profession at large against it by an argument whose mere statement is at once a confession of weakness that must deprive it of any significance?

The editorial writer in the *Journal* hardly treats his subject in that dispassionate style so clearly demanded of one that occupies so exalted a position. The opening paragraphs of the article incline one to the belief that he will find in them a calm, unprejudiced treatment of this new method of meeting the toxic conditions of morphinism, and he invites one, very courteously, to a "study of the chemic and physiologic considerations upon which its employment is based." Further perusal finds the subject of the employment of the potassium salt treated of in all its aspects, and when its use under the conditions of morphin-poisoning or opium-poisoning is taken up, the ultra-conservatism of the writer reveals itself but too clearly. It may be understood that the permanganate can act as a "chemic antidote, and renders inert the poison yet unabsorbed, with which it must be brought in contact. There is absolutely nothing to warrant the view that this agent can act as a systemic or physiologic antidote to morphin or any other toxic agent. . . . From what is known of the chemic nature and physiologic effect of permanganate of potassium, we must admit that the successful use of this agent administered hypodermatically in cases of lauda-

num-poisoning, is something we were not prepared for. . . . It is possible that when hypodermatically administered, although decomposed in the tissues, the nerve-centers may be influenced by some of its products; but even if so, it would not be the permanganate *per se*, but something else which does the work. . . . In the meantime, the distinction between a chemic and a physiologic antidote must be kept in view and, above all things, we should not require of a chemic antidote that it shall also be a physiologic one." Then follows that paragraph which forms the text for these remarks, and at its close we are left in wonderment as to what danger threatens our medical life, or how our professional standing will be compromised should we be led to employ this remedy in the management of some desperate case of opium-narcosis, when the established treatment has failed, as I have twice known it to fail, after most faithful and prolonged trial. Why, under such trying circumstances, "when a human life is trembling in the balance and fatal coma is threatening," must it be kept in view that a chemic antidote and a physiologic one are two distinct things, and even although the established treatment has failed thus far to bring relief, why should it be adjudged "criminal," this so-called experimentation with a therapeutic novelty, when its employment only implies "the rejection of the accumulated experience of the profession"—at the risk of saving a human life?

A few days ago I was hurriedly summoned to a patient exhibiting all the symptoms of profound morphin-poisoning. One hour previously I had administered a hypodermatic injection of morphin and atropin for the purpose of overcoming a condition of acute maniacal excitement that had persisted almost continuously for forty-eight hours, and which other means had entirely failed to relieve. The family had been apprised of the risk of so doing, for not only was I ignorant of any possibly existing idiosyncrasy of the patient,[1] but her exhausted state of system, as the result of a prolonged illness, in the closing stages of which I had been summoned, led me to fear a possible overwhelming effect of the morphin, which, in a less debilitated subject, need not have been anticipated from the amount of the drug employed. The nurse had been cautioned to watch closely the respirations, and not to lose any time in summoning aid should they fall to ten per minute. When I reached the patient I found her in profound stupor, with a livid aspect of countenance, and the coldness of extremities and of body-surface characteristic of the asphyxiated condition. The pulse was feeble, rapid, and irregular, and the few efforts at respiration, which were *three per minute*, were but faint gasps, in the intervals between which the woman lay without semblance of life, the faint, thready pulse being the only indication of the slight hold she maintained upon it. I at once entered with energy upon "the established treatment," which, "as a rule, is successful." Hypodermatic injections of atropin sulphate were given at frequent intervals, as much as gr. $\frac{1}{18}$ being administered when it was found that smaller doses were useless. An hour passed, and the outlook was a hopeless one. For fully half a minute there would be no effort at breathing at all, and artificial respiration alone maintained life for a time. It then occurred to me to try the potassium salt, and, ignorant of the necessity requiring one not to expect a chemic antidote to act as a physiologic one, I injected ten drops of a *saturated* solution of potassium permanganate into the forearm. Tweny minutes of anxious waiting passed, and twelve drops more were thrown into the tissues, and then for the first time there came an improvement in the depth and number of respirations. A third injection of fifteen drops was given twenty minutes later, as the improvement was not maintained. This proved entirely satisfactory, as the woman returned to consciousness, and voluntary efforts served to maintain respiratory effort on a safe basis. I did not leave her, however, for another hour, as she manifested a disposition to drowsiness, and I preferred taking no chances. No further treatment was employed, however, other than the administration of strong coffee and moral suasion, and when I left her it was with such feelings of gratitude to the potassium salt as could only find real expression in combating the very erroneous views of its efficacy advanced by the editorial in question.

In the face of such testimony as this regarding the value of "the new treatment," will any be found unwilling to make trial of potassium permanganate in a desperate case of opium-poisoning because he may, by so doing, be acting against the teachings of the profession, and disregard the theories concerning the action of this salt when taken into the human economy? Of what concern is it to us, or our patients dying from opium-poisoning, whether, when hypodermatically administered and decomposed in the tissues, it be "the permanganate *per se*" or "something else" which does the work? If only favorable results attend the use of the potassium salt when employed, even in most desperate cases of opium-poisoning, due either to ingestion of the poison into the stomach, or to its administration through hypodermatic means, why should it be asserted by any that "a new antidote to morphin was not urgently demanded," particularly, when the numerous failures that have attended "the treatment already in general use" are borne in mind? If Dr. Moor's experiments prove the entire reliability of the permanganate when "given immediately after the poison is swallowed;" and if the use of the salt hypodermatically has been the means of saving life in every instance but one in which it has thus been employed (and that one a necessarily hopeless case under any treatment, *vide* MEDICAL NEWS, vol. lxiv, No. 19, p. 514), why should not every reason exist for its employment at the very outset of the treatment of cases of opium-narcosis, if not as a special treatment of that condition, then as an adjunct, and a most valuable one, to the atropin and strychnin method, rather than

[1] I learned subsequently from the husband, who was absent from home at the time, that his wife had never been able to take morphin, as it always produced decidedly unpleasant effects. This statement was confirmed by the unusual result in the present instance, as for an hour after the injection had been given the woman slept quietly and the respirations were easy and natural. The change came suddenly and without warning, the breathing becoming labored and the number of respirations falling to six per minute, while the face became livid, and stupor appeared, and within fifteen minutes, when I had reached her bedside, her condition had become as described,

as a *dernier ressort*, and after the more usual methods have failed? And may we not justly question the position taken by the editorial writer in the *Journal* wherein he refuses to acknowledge "that the suggested treatment is a safe and efficient substitute for the approved methods already in use?" Yours very truly,

JAMES STRATTON CARPENTER.

POTTSVILLE, PENNA.

PERNICIOUS ANEMIA FOLLOWING PREGNANCY.

To the Editor of THE MEDICAL NEWS,

SIR: Mrs. M., pregnant for the third time, was troubled with obstinate nausea and vomiting during the last two months of her gravidity, instead of the first two, as had been the case before. Her health, however, seemed excellent and her strength quite good, despite this trouble. On May 2, 1894, she was delivered, the labor being entirely normal in every respect and scarcely the ordinary amount of blood being lost. Her gastric disturbance now subsided. On the day of the confinement the temperature was 100° in the morning and 101° in the evening; it remained elevated for about two weeks, after which it rose about one degree. Not till the tenth or eleventh day after confinement, however, was anything serious suspected. At this time the woman tried to sit up, but almost fainted from her great weakness. She had no pain, distress, or tenderness at any time. She complained only of weakness. She was quite pale and grew more so till the skin assumed a typically cachectic appearance as in carcinoma of the stomach, and her breath was very offensive as in that disease. Emaciation was not marked. In spite of heroic treatment with iron, arsenic, and other tonics, with nutritive enemata, the woman slowly and gradually failed and died June 2, 1894. At the post-mortem examination, made by Dr. Chamberlain, it was seen that the body was not at all emaciated, but the anemia was so extreme that the instruments and hands when washed did not even tinge the water. There was no blood in any of the vessels except the aorta. Not the slightest evidence of disease, acute or chronic, was found in any of the internal organs. The article on "Fatal Nausea and Vomiting of Pregnancy," in THE MEDICAL NEWS of June 2, 1894, has prompted me to report this case.

Yours truly, J. A. BROBERG.

DELAVAN, MINN.

THE TRANSMISSIBILITY OF TUBERCULOSIS.

To the Editor of THE MEDICAL NEWS,

SIR: In the discussion before the College of Physicians, of Philadelphia, upon the registration of tuberculosis, on January 12, 1894, I made the following statement: "Dr. Williams, of the Brompton Hospital, has been quoted as an opponent of the theory of contagion, but he has written a paper in which he shows that a large number of nurses of the Brompton Hospital have contracted tuberculosis. I think that he has traced some fifteen or twenty cases."[1] Dr. Williams has called my attention to the fact that I misquoted his article and a rereading shows that this is true. In my remarks, I spoke from memory and entirely extemporaneously. The fifteen or twenty cases which I credited to nurses occurred among persons who had been employed in one capacity or another about the hospital, and only one case occurred in a nurse during her term of service. The time covered by Dr. Williams' investigation is thirty-six years. Whilst I still believe that the conclusion drawn from Dr. Williams' paper (namely, that the experience of the Brompton Hospital cannot be used as an argument against the theory of the contagiousness of tuberculosis) is correct, I deeply regret having misquoted Dr. Williams and cheerfully make the correction. Dr. Williams contends that his paper "furnished only one case of consumption, contracted during residence, among the Brompton nurses, and that a doubtful one, in a period of thirty-six years." Respectfully,

LAWRENCE F. FLICK.

PHILADELPHIA, 736 PINE STREET.

[1] See THE MEDICAL NEWS, February 10, 1894, p. 165.

RECOVERY FROM TOXIC DOSES OF MORPHIN.

To the Editor of THE MEDICAL NEWS,

SIR: The comment on "Recovery from Toxic Doses of Opium and its Derivatives" leads me to report in brief a case never before published.

In September, 1889, Dr. Akins, of Loraine, Ill., and I were called to see a strong girl who had taken fifteen grains of morphin sulphate four hours before, with suicidal intent. So long a time having elapsed after the ingestion of the poison, we did not try to empty the stomach. We gave hypodermatic injections of atropin sulphate till the pupils were dilated, and used inhalations of amyl nitrite as a stimulant. The girl regained consciousness in about fourteen hours, was delivered of premature twins soon after, and made a good recovery.

Respectfully, D. D. STEINER.

QUINCY, ILL.

SOCIETY PROCEEDINGS.

AMERICAN MEDICAL ASSOCIATION.

Forty-fifth Annual Meeting, held at San Francisco, Cal., June 5, 6, 7, and 8, 1894.

(Specially reported for THE MEDICAL NEWS.)

GENERAL SESSION.

THIRD DAY—JUNE 7TH.

THE apparently perennial contest over the revision of the Constitution and Code of Ethics of the American Medical Association was renewed at this session. For a time the battle between the majority and the minority factions waged fiercely, but at its close the situation remained exactly as it was before the struggle began several years ago.

Odd Fellows' Hall was well filled when PRESIDENT HIBBERD called the meeting to order. After the usual announcement of plans to promote the pleasure of delegates, prepared by DR. PLUMMER, the majority report of the Committee on Revision was presented by DR. HOLTON. It was essentially the same as the new Constitution proposed at Milwaukee two years ago. The revised Constitution and Code would open the doors to all members of the profession in good standing and remove the barriers now existing.

The minority report was offered by DR. DIDAMA, of

New York. DR. FERGUSON, of New York, moved the substitution of the minority report for that presented by the majority of the committee.

DR. QUIMBY, of New Jersey, made a vigorous speech in favor of the minority report. Applause and hisses, equally mingled, greeted his remarks.

By a vote of 161 to 70 the minority report was made the report of the committee, and the conservative element was in its glory.

DR. WALKER, of Virginia, then moved the adoption of the report as a whole.

The roll was called and 215 delegates responded to their names. The Chair stated that a three-fourths vote was necessary to change the Constitution. The vote was announced as 151 ayes to 64 noes, and the motion was declared lost. The old Constitution and Code, without amendment of any kind, therefore, remains in force.

After the adoption of a resolution designed to promote the interests of the *Journal*, the session was adjourned.

FOURTH DAY—JUNE 8TH.

The meeting was called to order by PRESIDENT HIBBERD. After the usual announcements by the Chairman of the Committee of Arrangements, the question of the amendments to the Constitution was taken up. After a lively contest the consideration of the matter was indefinitely postponed. DR. HOLTON presented a majority report on the Revision of the Code of Ethics. DR. DIDAMA followed with the minority report.

A motion by DR. INGALLS to lay the whole matter on the table was carried. Later in the session DR. MARCY, of Boston, moved that all matter relating to the Constitution and Code which had been laid on the table be again taken up for consideration. Carried.

He then moved to indefinitely postpone the revision of the Constitution. Carried.

A motion that a statement making clear the provisions of the Code be published in the *Journal of the American Medical Association*, explanatory of the exact position of the revision contemplated, was adopted.

DR. WINGATE, Chairman of the Committee on the Establishment of a Department of Public Health at Washington, urged the advisability of endeavoring to put an officer in the Cabinet. In case this could not be accomplished a national sanitary officer should be appointed.

DR. COCHRAN, of Alabama, suggested there should be a conference held at Washington annually for the consideration of questions of public health. Both suggestions were adopted.

The report of the Business Committee, recommending that members be allowed to go three years without paying dues before they are dropped from the roll, was adopted.

A resolution apropos of the death of DR. J. H. RAUCH, of Illinois, was presented and unanimously adopted.

A letter from the Minnesota State Medical Society, extending to the members of the American Medical Association an invitation to visit the St. Paul Medical Convention on their way East, was read by SECRETARY ATKINSON.

The following preamble and resolution were offered:

Whereas, The interests of the *Journal of the American Medical Association* require that it should command the confidence of the members of the Association in affiliation with the Association; and,

Whereas, The *Journal of the American Medical Association* has continued to publish unethical advertisements like those of Antikamnia, Labordine, and other secret nostrums, and that of the American Physicians Sanitarium Company offering $100 worth of stock to physicians sending it patients; and,

Whereas, The Trustees of the *Journal* have defended such a course on the ground that the money from such advertisements was needed to publish such a journal as they thought creditable to the Association;

Resolved, That the various State Medical Societies in affiliation with this Association are hereby requested to inform this Association whether their members approve the policy of admitting such advertisements to the pages of the *Journal of the American Medical Association*.

A motion to lay the resolution on the table was lost.

On motion, it was referred to the Judicial Council.

A vote of thanks to the medical profession of California for courtesies extended to the American Medical Association was adopted unanimously.

The addresses on "General Surgery," by DR. ERNEST LAPLACE, of Pennsylvania, and on "State Medicine," by DR. GEORGE H. ROHÉ, of Maryland, were read by title, owing to the absence of their authors.

The newly-elected President, Donald McLean, was escorted to the platform. He delivered a short address replete with expressions of the kindest feeling toward the members of the Association, and full of appreciation for the honor and courtesies bestowed upon him.

After a few words of thanks to the Association for the consideration shown him during the past year, Dr. Hibberd closed the session.

SECTION ON PRACTICE OF MEDICINE.

SECOND DAY—JUNE 6TH.

DR. C. M. RICHTER, of San Francisco, read a paper entitled "The Influence of Atmospheric Pressure upon the Prevalence of Pneumonia." He contended that pneumonia does not evince a bacillary origin, and that even in well-marked cases the specific germ is rarely found. There are several forms of pneumonia. Epidemics generally affect children under five and adults over fifty years of age in greater proportion. The liability to pneumonia begins with zero at the poles and gradually increases to a point in the temperate zone, then again diminishing toward the equator. Winter and early spring show the greatest proportion of cases; summer and early autumn the least. This may be explained by the greater maximum atmospheric pressure during the months when pneumonia is prevalent, *i. e.*, the more continuous the maximum high atmospheric pressure the greater the occurrence and mortality of pneumonia. Statistics were given covering a number of years and including the large cities of Europe, America, and Australia, in support of the position taken. A more extensive and thorough line of research was urged, with a view of learning the effect of continuous or extreme high atmospheric pressure upon the organism.

DR. A. W. PERRY, of San Francisco, expressed doubts as to high pressure acting as a causal agent in pneumonia. He pointed out that pneumonia is common in the mountain towns of California. Information gained

from practitioners in these towns does not indicate that the disease is more prevalent or more fatal because of the high barometric pressure. The question was asked if it was meant that pneumonia was caused by high or low barometric pressure, by the oscillations, or by outbursts of pressure.

DR. KELLOGG, of Milwaukee, asked if the statistics given were made from deaths or from all reported cases.

DR. RICHTER in closing said that according to his statistics pneumonia was not more prevalent in the mountainous districts than in the valley towns and cities. It is not the oscillations of pressure, but the maximum continued high pressure to which he referred. His statistics were prepared only from the deaths, as there is no means of learning the actual number of cases.

DR. WASHINGTON AYER, of San Francisco, read a paper entiitled "Fever and the Relations of Microörganisms to Disease." He assumed a negative position as to the germ-theory, stating that he considered some conservatism necessary in this day of bacteriology. He looked upon fever as an important factor in almost every disease. In its ordinary sense fever means an exalted temperature of the blood as a result of increased tissue-destruction. Mutation and nutrition are interrupted. He called attention to the fact that even the same type of fever shows great variations in different patients and even in the same individual. From this he concluded that if the germs were the *materies morbi* there would be more uniformity. Does convalescence show that the germs have ceased to proliferate or that they are subdued by therapeutic measures. Typhoid fever is generally milder in course on the Pacific slope than on the Eastern coast, and yet the *casus belli* is claimed as one and the same. In the opinion of Dr. Ayer one example, viz., intermittent fever, makes the germ-theory for fevers untenable. He concluded by urging more careful work in practical medicine and less in the dreamland of microscopy. At present investigation has only proved the existence of organisms.

DR. W. F. MCNUTT, of San Francisco, read a paper entitled "Tubercular Peritonitis." He reported four cases in which he had performed celiotomy for *primary* tuberculous peritonitis. Ordinary abdominal drainage was employed, but no medication. In all, complete and permanent recovery took place. They were considered primary because no evidence of a tuberculous process in other organs was found. In all four cases the peritoneum was thickened, covered with myriads of miliary tubercles, and the abdominal cavity contained an exudation varying in character in the different cases. Microscopic examination of a piece of the peritoneum, the site of tubercles, showed the histologic elements to be those of tubercle, although no tubercle-bacilli could be detected. A point dwelt upon was the peculiar shape of the abdomen noted in cases of tuberculous peritonitis with effusion. It resembles that due to cystic disease and not that common in ordinary ascites. This peculiarity was attributed to the fact that the effusion occurs into the thickened peritoneal wall.

DR. JOHN F. CARPENTER, of Pottsville, Pa., read a paper entitled "The Pathology of Tetany." He stated that from recent contributions tetany is now considered a nervous disease, although no distinctive post-mortem changes have been found to show the exact nature of the disease. A second cause of pathologic uncertainty lies in the fact that the disease occurs in various forms, viz.: (1) Rheumatic, acute, or epidemic tetany, which is generally fatal; (2) Chronic, due to chronic diarrhea, prolonged lactation, etc., from which recovery is usual; (3) Occurring in the course of dilatation of the stomach; (4) Surgical tetany, following removal of the thyroid gland especially, which is generally fatal. Tetany is also found to follow such diseases as induce a morbid discharge from mucous surfaces and such as are due to sepsis. This is especially true of the puerperium when complicated by septic infection. It was contended that sepsis is clearly traceable as the causal agent of tetany. In all of the conditions predisposing to its occurrence septic infection is clearly probable. Furthermore, sepsis and septic absorption will account for other grave nervous disorders by causing profound anemia, which is the proximate cause of nervous irritation. Habit also has some influence. Thus attacks of tetany may be kept up by a condition of unstable equilibrium set up by the original attack. Owing to antiseptic precautions tetany is but little known, and the belief was expressed that in the near future the disease would be wholly one of the past.

THIRD DAY—JUNE 7TH.

DR. JOHN ELIOT WOODBRIDGE, of Youngstown, Ohio, read a paper on "Typhoid Fever." He expressed confidence that the disease could be aborted by the use of antiseptics, such as thymol, guaiacol, and eucalyptol.

DR. A. W. PERRY, of San Francisco, read a paper entitled "Diagnosis and Treatment of Diseases of the Stomach by the Stomach-tube." He stated that most disorders of the stomach depended upon fermentations or abnormal accumulations in quantity or quality in that organ. The fermentations were acetic, lactic, butyric, cellulose, etc. Lactic-acid fermentation develops normally within from fifteen to twenty minutes after digestion commences, but is held in check by the hydrochloric acid of the gastric juice. Acetic and butyric fermentations are prevented by a more rapid and complete emptying of the stomach. By means of the stomach-tube we can determine the existence or non-existence of dilatations as well as the chemic composition of the gastric contents.

Spasm of the glottis may interfere with the introduction of the tube. This may be overcome by touching the back of the pharynx with the finger. Cocain can also be used. In some cases the circular fibers of the esophagus contract, and thus obstruct the passage of the tube. The stomach-tube should be used only every second, third or fourth day. During the intervals the internal administration of an anti-fermentative was recommended. Resorcin, gr. v, after meals, does not interfere with the digestive processes. The use of the stomach-tube will prove valuable in the diagnosis of carcinoma and ulcer of the stomach by allowing a quantitative test for hydrochloric acid.

Lavage has been found of benefit in the treatment of acute and chronic gastric catarrh; dilatation of the stomach not dependent upon pyloric obstruction; various fermentations, causing reflexes; carcinoma; ulcer; and finally in obstinate singultus.

DR. FREEMAN, of Indiana, related that he had found that by the frequent use of the esophageal bougie, between the acts of lavage, the esophagus became tolerant of the presence of the tube.

DR. R. W. MURPHY, of San Francisco, read a paper entitled "The Law of Equivalence in Medical Science." He expressed the belief that before many years have passed prophylactic measures will be discovered for such diseases as nephritis, carcinoma, tuberculosis, etc., as has already been the case with smallpox, hydrophobia, etc. He called attention to the great diversity of treatment directed toward the same disease, and believed we should have more practical text-books on drug-actions, both as regards maximum and minimum dosage.

He predicted that the physician of the future would be the man who closely watches the dual action of his drugs. In the case of calomel, cited as an instance, we may find physicians recommending a dosage varying from gr. $\frac{1}{20}$ to gr. xl for the same disease, and under apparently the same conditions. The same may be said regarding almost all of the drugs in use. Among other remedial agents electricity is largely employed without any thought of the laws of equivalence.

The following papers were read by title:

"Champagne and Strychnin in Chest-troubles of the Aged," by DR. G. EDWARD BUXTON, of National City, Cal.; "The Treatment of Erysipelas," by DR. JAMES M. ANDERS, of Philadelphia, Pa.; "The Use of Turpentine in the Treatment of Diphtheria," by Dr. E. W. KELLOGG, of Milwaukee; "Lung-gymnastics in the Treatment of Chronic Disease," by Dr. L. P. WALBRIDGE, of Decatur, Ill.; "A Clinical Study of Scarlatina at High Altitudes," by DR. J. N. HALL and DR. WM. P. MUNN, of Denver.

Dr. E. W. Kellogg, of Millwaukee, was elected Chairman of the Section, and Dr. W. E. Quine, of Illinois, Secretary, for the ensuing year.

SECTION ON SURGERY.

SECOND DAY—JUNE 6TH.

DR. EMMET RIXFORD read a paper entitled "Early Symptoms and Diagnosis of Tubercular Joint-disease." He detailed briefly the symptoms that are to be depended upon in the early recognition of the disease and its differential diagnosis.

DR. L. H. SAYRE, of New York, read an interesting and instructive paper on the "Conservative Treatment of Tubercular Joints." He laid much stress on the manner of applying the plaster cast in the treatment of joint-disease.

DR. S. STILLMAN, of San Francisco, followed with a paper on the "Treatment of Tubercular Joints by the Injection of Iodoform." He dwelt on the technique of the operation and on the location of the tuberculous foci.

This was followed by a general discussion of the various methods employed.

DR. L. C. LANE, of San Francisco, read a paper on "Concussion of the Brain." After reviewing the history of the subject and giving a general *résumé* of the various theories brought forward in regard to the subject since 1840, he explained why in most cases the diagnosis is easy, whereas in other cases it is most difficult, especially when there is no history of a blow or a fall upon the head. He divided the cases into three general classes or grades: (1) the mild; (2) the severe; and (3) the fatal cases.

As symptoms, he enumerated vertigo, faintness, weakness, drowsiness, and coma. The prognosis depends on the extent of the injury. As after-effects in some cases were mentioned melancholia and mania.

A paper on the "Treatment of Fractures of the Lower End of the Humerus," by DR. O. H. ALLIS, of Philadelphia, who was absent, was then read by the Chairman. The main point brought out was the advantage to be derived from treating such injuries with the arm in extension and the patient in the recumbent posture. This facilitates the circulation of the blood, the examination of the part, and the renewal of the dressing. Passive motion was only to be used in the latter half of the treatment. A lengthy discussion followed, which was represented on the one side by DR. LANE, who favored the method employed by Dr. Allis; and on the other side by DR. SAYRE, who favored the rectangular position.

The subject of hernia was then taken up.

A paper entitled "The Treatment of Strangulated Hernia," by DR J. RANSOHOFF, of Cincinnati, Ohio, was listened to with marked attention. He emphasized the great importance of immediate operative interference in the case of strangulated hernia and the great danger to be apprehended from prolonged taxis, which has a tendency to decrease the vitality of the gut, as well as to make the subsequent operative procedures less favorable in their results.

DR. A. E. ROCKEY, of Portland, Oregon, then followed with an interesting paper on "Observations on the Radical Cure of Inguinal Hernia." He advocated the idea of operative interference also in many cases of long standing and in cases in which the hernia is very large.

DR. H. O. MARCY then read a paper on "The Radical Cure of Hernia." He advocated the use of kangaroo tendon in suturing in preference to catgut.

A lively discussion followed, which showed that there are still many adherents of the conservative method of treatment.

DR. SCHIEL read a paper entitled "A Plea for the Better Teaching of Anatomy." He said that among all medical studies anatomy probably ranked first in importance. The lack of interest shown by students in the study of anatomy was, he thought, largely due to the methods of teaching. He also laid great stress on the evil results consequent upon a deficient education in this branch of medical science. These, he said, were not only meted out to the physician, but also to the patient, who, falling into the hands of a practitioner with only a superficial knowledge of anatomy, was like a lamb being led to slaughter, unconscious of the danger that awaits him.

THIRD DAY—JUNE 7TH.

DR. C. F. BUCKLEY, of San Francisco, read a short paper on "The Symptoms and Treatment of Tumors of the Bladder." He related three cases of tumors of the bladder undoubtedly produced by traumatism to the perineum. He indicated that in his opinion not enough attention was paid to injuries of this sort.

This paper was followed by a voluntary contribution on the subject of "Anti-fermentative Surgery," by DR. HOGAN, of Texas.

DR. C. F. BUCKLEY then exhibited two very interesting specimens. One was a slate-pencil removed from the bladder of a male subject by the median operation. The other specimen was a collection of gall-stones removed from the gall-bladder of a patient during life.

DR. DAVID POWELL, of Marysville, Cal., read an instructive paper on "The Pathology and Symptomatology of Hemorrhoids, Anal Fistule, and Anal Fissure." Clinically he divided piles into external and internal, although the pathology of both is the same. The veins involved are the inferior and superior hemorrhoidal plexuses. In the initial stage the condition is nothing more than one of dilatation of the rectal veins. Later, characteristic changes take place and the tumor enlarges. As causes he enumerated fecal accumulations, the gravid uterus, or some obstruction to the hepatic circulation. Internal hemorrhoids he classified into (1) venous, (2) arterio-venous, and (3) capillary. Anal fistule, it was pointed out, usually originates in an ulcer. It may also be caused by a thrombus or by tuberculous foci that undergo suppuration. This trouble is often not accompanied by any urgent symptoms.

Anal fissure was considered a most important subject practically, not because of its pathology, but rather because of the pain and annoyance that invariably accompany it. Among the characteristic symptoms are dull, aching pain, aggravated by evacuation of the bowels, morning diarrhea, loss of blood, continual irritation of the genito-urinary organs, and tender prostate. The constitutional disturbances are often marked. If the trouble remains unrelieved the patient becomes pale, anxious, and looks careworn.

DR. G. B. SOMERS, of San Francisco, read an interesting paper on "The Treatment of Anal Fistule." It was shown that the treatment is by no means always simple, on account of two complications: (1) cicatricial tissue was frequently found in the canal, and (2) collateral sinuses often existed, hindering the surgeon in his work. In most cases the fistula is preceded by an abscess, which may be either pyogenic or tuberculous in origin, and which imparts to the fistula its characteristic aspect.

The methods of treatment are mainly four: (1) by injection, (2) by ligation, (3) by Mathews' fistulatome, and (4) the radical operation with the knife. Dilatation of the sphincter should always precede the operation.

DR. THOMAS W. HUNTINGTON, of Sacramento, read a paper on "The Treatment of Anal Fissure." He stated that anal fissure, though more common between the ages of twenty and thirty-five, occurs at times during infantile life and in old age. It occurs as often in men as in women, a view not generally held up to this time.

The symptoms are morning diarrhea, tenesmus, intense paroxysmal paralyzing pain, quite out of proportion to the size of the ulcer.

There are two general methods of cure, (1) by dilatation of the sphincter, and (2) by incision. Incision should always be done under anesthesia. Dr. Huntington favored the combined plan of incision and dilatation.

A paper was read by DR. ROSENSTEIN on the subject of "Treatment of Stricture of the Urethra." He briefly detailed his experience with the employment of gradual dilatation and internal urethrotomy. In summing up he stated that he decidedly favored gradual dilatation, and that in his opinion internal urethrotomy will eventually be abandoned because of the dangers associated with the operation, and because the cure after urethrotomy is not any more permanent than after gradual dilatation.

DR. THOMAS, of Pennsylvania, said that in certain cases he decidedly favored internal urethrotomy, in others divulsion.

DR. HUNTINGTON remarked that he rather favored internal urethrotomy, as gradual dilatation did not always cure the discharge.

DR. DODGE, of Michigan, said that he had seen worse reactions from the use of the sound than from internal urethrotomy.

It seemed to be the consensus of those present that internal urethrotomy was well adapted to many cases, and that it will always occupy a place in surgery.

It was also thought by many that the cure of stricture is not a permanent one, and that sounds have to be used at shorter or longer intervals to keep the stricture from again contracting.

FOURTH DAY—JUNE 8TH.

The first paper presented was entitled "New Plastic Operation for Varicocele," with presentation of a case, by DR. O. J. MAYER, of San Francisco. The feature of the operation is the transverse suturing of the longitudinal wound, by which the scrotum is considerably shortened. A case that had been operated on was presented.

Dr. MAYER then read a paper on "Bloodless Vaginal Myomectomy," the essential step in the operation being the temporary ligation of the uterine arteries.

An interesting and instructive paper was presented by G. W. WOODS, of Mare Island, California, on "The Use of Acetanilid in Medicine and Surgery, with Special Reference to its Use in Minor Surgery." He maintained that acetanilid is a good antipyretic, and not poisonous if given in small doses at the commencement, even to children. It acts slowly, and is both a diaphoretic and diuretic. It may be given in any and all fevers and inflammations. It is a good substitute for iodoform in venereal sores. Its application to a granulating surface is followed by a burning sensation, which, however, persists only a short time. It is useful in the dressing of all forms of burns, ulcers, moist eczema, gunshot wounds, abscesses, etc. When applied to extensive granulating surfaces it sometimes produces cyanosis, which is not due to a disturbance of circulation, but to deficient oxygenation of the blood. The following advantages of acetanilid as a surgical application were pointed out: Its cleanliness, its lack of odor, its antiseptic and desiccating qualities, its practical freedom from toxicity, the absence of crusting and the ease of removal, the insignificant cost, and its resistance to moisture.

A paper, by DR. THOMAS, of Pennsylvania, on "How Long is Syphilis Contagious?" followed. He expressed his conviction that syphilis is only contagious in the primary and secondary stages—that is, only for three or four years after the primary lesion.

A very rare and interesting case of multiple, symmetrical, bilateral lipomata was then presented by DR. SCHIELS. The lipomata were not limited to any partic-

ular part of the body, but occupied positions from the neck down to the groin.

DR. BONWILL, of Philadelphia, then read a paper on "A Surgical Engine." This engine, which was very similar to the ordinary dental engine, caused the trephine or burr to revolve from 100 times to 20,000 times a minute. It is said to be adapted to the performance of all sorts of surgical operations, both upon the soft parts and upon bony tissue.

DR. JOSEPH RANSOHOFF, of Cincinnati, was elected Chairman, and DR. REGINALD H. SAYRE, of New York, Secretary.

SECTION ON OBSTETRICS AND DISEASES OF WOMEN.

SECOND DAY—JUNE 6TH.

The first paper was one by DR. LLEWELLYN ELIOT, of Washington, D. C., on the subject of "Placenta Prævia." In his absence, the paper was read by the Secretary. Placenta prævia was considered, next to puerperal convulsions, the most serious complication that can occur to the puerpera. The physician is usually not called till hemorrhage has appeared. No woman should be allowed to suffer from these hemorrhages if the child is viable, for it is as easy to resuscitate a child at seven months as it is a child at nine that has been subjected to the weakening effects of repeated hemorrhage. It was considered the proper course to pursue, to forcibly dilate, turn, and deliver, the child acting as a tampon in controlling the hemorrhage. Dr. Eliot would hesitate to resort to Cesarean section.

DR. ESHLEMAN, of Fresno, said that placenta prævia is much more common than is generally supposed, a large number of abortions being due to this complication. He objected to forcible dilatation and introduction of the hand for the performance of version. All that is necessary is to dilate the cervix sufficiently to introduce a small forceps, seize the head, and using it as a tampon, bring it down and deliver the child. The os is usually very dilatable, particularly if the hemorrhage has been severe.

DR. MCCHESNEY, of Philadelphia, said that in a case of placenta prævia there is no time for nice distinctions. One must use what means he can to dilate the cervix, then turn, and deliver. Hemorrhage after delivery is checked by copious injections of hot water, massage, and ergot, or ergot and strychnin hypodermatically, or by the mouth.

DR. MARTIN, of Chicago, said that it had been noticed formerly that fever invariably followed the delivery of women in cases in which it had been necessary to introduce the hand into the uterus. We know now the cause of this. As much care should be taken in preparing the hands preliminary to introduction into the cervical canal and uterus as in a case of celiotomy. He recommended for this purpose the use of a saturated solution of potassium permanganate and oxalic acid, as used at the Johns Hopkins Hospital.

DR. MONTGOMERY, of Philadelphia, believed that placenta prævia was the one condition in which the life of the child should not be considered. In central placenta prævia hemorrhage usually begins about the fifth month. The patient may have a fatal hemorrhage at any moment. As soon as the diagnosis is established the uterine contents should be evacuated. When there is lateral implantation and the hemorrhage slight and later, we may temporize; but even in these cases it is well to bring on premature labor. Cesarean section was not deemed necessary or advisable.

DR. NEWMAN, of Chicago, thought that dilatation, version, and delivery constituted the best and safest method. The case should be treated strictly on surgical principles. With regard to the use of an anesthetic, he would hesitate to use chloroform after extreme hemorrhage. He thought better work was done with the use of an anesthetic, and ether was safe.

DR. E. M. WESTLEY, of California, has adopted different methods. If the patient is exsanguine when the physician arrives the life of the child cannot be considered. The placenta should at once be detached and brought down; then the head of the child should be brought down and the child delivered. If hemorrhage is slight and the child alive, version before delivery is to be preferred.

DR. ESHLEMAN, of Fresno, Cal., emphasized the fact that in turning it was necessary to dilate the cervix to the size of the physician's hand and run all the risk of septic infection. In introducing the forceps according to his method, a dilatation of an inch was sufficient.

DR. CARPENTER, of Pennsylvania, reported that he has had three cases lately. In two he applied the forceps high up after getting the head into position by external manipulation. He then brought the head down so as to compress the placenta, which had previously been pushed to one side. In one case he held the forceps in place one-half hour before dilatation was accomplished. The patients were sustained by hypodermatic injections of whiskey and strychnin. In the third case, one of central implantation, he found the patient moribund when he arrived. He tore through the placenta and found a foot, which he seized, and delivered the child as soon as possible. The patient died. With the hemorrhage controlled the physician can afford to wait, and Dr. Carpenter believed that if he had been less hurried in his procedure, and had improved the delay by the administration of proper stimulants, he might have saved his patient.

A communication upon "Tetanus Puerperarum," by DR. ALLISON MAXWELL, of Indianapolis, was read by Dr. E. E. Montgomery. The history of a case of this rare disease was detailed, the etiology of the disease reviewed, and besides prophylactic measures, the use of antispasmodics and the antitoxin recommended in its treatment.

DR. MCCHESNEY, of Philadelphia, said that the offending cause resided in some kind of diet. The disease presupposed some point of infection, and should have directed against it local treatment aimed at its removal. In a case in which the initial symptoms of tetanus had appeared, Dr. McChesney used an intra-uterine douche of two quarts of a 1:3000 bichlorid solution every eight hours, following this by water that had been recently boiled. He used at the same time hypodermatic injections of atropin and rectal injections of peptonized milk.

At the request of the inventor, DR. MONTGOMERY presented an instrument designed to be used in cases of prolapsed uterus to fix the uterus to the abdominal wall. The instrument was generally condemned.

The PRESIDENT replied to some remarks made in the

Surgical Section reflecting upon private hospitals and their owners. He said that the attack upon private hospitals struck at the very life of abdominal surgery. It was in a private hospital that it was born, nourished, and grew to full maturity. He resented the imputation of dishonesty on the part of surgeons.

THIRD DAY—JUNE 7TH.

DR. X. O. WERDER, of Pittsburg, Pa., read a paper entitled "A Case of Didelphic Uterus, Unilateral Hematometra, Hematosalpinx, and Hematocolpos."

At the conclusion of this paper DR. CHESTNUT, of Philadelphia, moved an adjournment, so that the members might participate in the General Session. The motion was carried and the Section adjourned to 3 P.M.

At 3.30 P.M., the President of the Section being absent, DR. MEADE, of San José, moved that Dr. G. W. Davis, of San Francisco, act as temporary chairman, and that the work of the Section proceed. The motion was carried and Dr. Davis took the chair.

DR. BRIGGS, of Sacramento, read a paper on "The Function and Form of Obstetrical Forceps," using in demonstration instruments invented by himself.

DR. E. S. MEADE, of San José, pointed out that these forceps presented an anatomic defect, as the pelvic curve was wanting. She thought the instrument was too complicated. Great force was not necessary in delivering a child with instruments. She applied the forceps, used traction during the pains, and readjusted the instruments as it might be necessary during the intervals between pains. Sometimes as long as half an hour would be necessary to accomplish the delivery. Too often physicians thought only of quick work, without considering whether or not the mother and child were wounded. She considered that it was impatience and lack of anatomic knowledge that destroyed so many uteri and perinei.

DR. OSCAR MAYER, of San Francisco, thought the complicated nature of the instruments was opposed to the principles of obstetric asepsis.

DR. WINTERBERG, of San Francisco, thought it a very easy matter to find an obstetric case in which this and all other necessary instruments can be placed and the whole thoroughly sterilized by heat.

DR. BRIGGS said that the curve was greater than it seemed, being equal to three inches. It appeared less than this because the handle was parallel to the axis of the blade, while in the ordinary forceps it formed an angle.

DR. OSCAR J. MAYER, of San Francisco, read a paper upon "Massage in Gynecology." He said the object of uterine massage is to bring about a healthier state of the circulation and to impart tone to the various structures of the genital tract. It is indicated in all chronic inflammatory disorders, as well as in conditions that cause uterine displacements, such as relaxation of the ligaments or pelvic exudation, with or without adhesion. It is very important to form a correct diagnosis of the disease and to exclude all pyogenic disorders. The indications for massage in gynecology are the same as those for massage in surgery. By massage-treatment it is hoped to produce: 1. Acceleration of the absorption and retrogression of inflammatory and traumatic exudation and deposits. 2. Stretching, loosening, disintegration of cicatricial or hypertrophied connective tissues, caused by inflammatory processes. 3. Stimulation of the circulation and restoration of the normal elasticity and tone in (*a*) contracted, hardened, and hypertrophic tissues, or (*b*) relaxed tissues.

The sphere of usefulness may be tabulated as follows: 1. Pelvic exudations and hemorrhagic infiltrations. 2. Chronic parametritis and perimetritis. 3. Retroversion of the uterus. 4. Chronic metritis. 5. Prolapse of the uterus and vagina.

Massage is contra-indicated in all diseases of the genital tract requiring perfect rest of the whole body or of the genital tract alone.

The best and quickest cures from massage are observed in chronic diseases following the puerperal state. A longer time is required in conditions following acute inflammatory processes; also when coincident with anomalies of position of the pelvic organs, especially in retrodeviations of the uterus. Even if we do not succeed in some cases in restoring the uterus to its exact normal position we can obtain a symptomatic cure without recourse to surgical procedure. The combination of massage with electricity is to be recommended in the relaxations of the supports of the uterus, provided the structures are intact.

By exercising proper circumspection, we can often achieve more by alternating massage with other treatment than by long-continued massage. It was not claimed that massage constitutes an independent and sufficient form of treatment. It is only a mechanical therapeutic agent, intended to be used in combination with other tried and accepted remedies, in affecting a permanent cure, or in considerably lessening the time formerly required therefor. American gynecologists have been somewhat slow in accepting massage as a new remedial agent to be employed in diseases of women, and have been suspicious of the beneficial results that have been claimed for it. But the constant encouraging reports of European authorities, many of them at first bitter opponents of massage, are bound to work a change in this American sentiment.

DR. J. H. BARBAT, of San Francisco, bore testimony to the great good accomplished by massage, combined with electricity and glycerin tampons, even in cases in which the removal of the ovaries had been recommended by competent physicians.

DR. SHUEY, of Oakland, Cal., said that she had used massage in the painful menstruation of young women with the result of conferring perfect relief. The treatment was repeated every day for three or four weeks, and for three or four months longer during the menstrual period.

Dr. C. N. Martin was elected Chairman, and Dr. X. O. Werder, Secretary, for the ensuing year.

ASSOCIATON OF AMERICAN ANATOMISTS.

Sixth Annual Meeting, held at Washington, D.C., May 29, 30, 31, and June 1, 1894.

THE Secretary reported that Dr. Charles B. Ewing and Dr. F. C. Schaefer had resigned, and that three members had died, namely: Dr. William Lee, Dr. William B. Towles, and Dr. Corydon L. Ford.

The following new members were elected: Dr. John

A. Boger, Dr. H. B. Ferris, Dr. Robert L. Greene, Dr. William Keiller, Dr. Joseph Leidy, Dr. Mary B. Moody, Mr. Robert O. Moody, Dr. Charles D. Smith, Dr. William O. Stillman, Dr. W. C. Woodward. Sir William Turner, of London, was elected an honorary member.

The officers elected for the ensuing year were: Dr. Thomas Dwight, President; Dr. B. G. Wilder, First Vice-President; Dr. F. J. Shepherd, Second Vice-President; Dr. D. S. Lamb, Secretary and Treasurer.

Professor C. L. Herrick, of Denison College, Granville, Ohio, Delegate to the Congress of American Physicians and Surgeons; Dr. D. K. Shute, Alternate. Dr. Theo. N. Gill was elected to the vacancy in the Executive Committee.

The following papers were read: "On the Identity of Structure of Protoplasm with that of Striped Muscle," by Dr. Carl Heitzmann, of New York City.

"Some Problems relating to the Cerebral Fissures," by Dr. Burt G. Wilder, of Ithaca, N. Y.

"A Plea for a Methodically-written Text-book on Anatomy," by Dr. Edmond Souchon, of New Orleans.

"The Study of the Human Cranium;" also, "The Shortening of the Face-axis in the Evolution of the Mammalia," by Dr. Harrison Allen, of Philadelphia.

"Methods of Estimating the Height from Parts of the Skeleton," by Dr. Thomas Dwight, of Harvard University.

"The Perineum and Perineal Body," by Dr. D. K. Shute, of Washington, D. C.

"The Study of the Muscular Tunic of the Large and Small Intestine of Man in the Region of the Cecum; also, "A Note on the Occurrence of the Scapuloclavicular Muscle," by Mr. R. O. Moody.

"Theoretical Anatomy of the Sympathetic System," by Dr. William Carr, of Columbian University, Washington.

"The Female External Genital Organs: a Criticism on Current Anatomical Description," by Dr. Lamb, of the Army Medical Museum, Washington, D. C.

The following papers were read by title in the absence of the authors:

"In Our Two Years' Study of Anatomy what part of the Subject should be Covered in the First Year's Work, what part in the Second?" by Dr. A. D. Bevan, of Rush Medical College.

Two papers, by Professor P. A. Fish, of Cornell University, namely: "The Form and Relations of the Nerve-cells and Fibers in Desmognathus Fusca," and "The Terminology of the Nerve-cell."

An abstract of these papers and the discussions will be published with the proceedings of the Association.

NEWS ITEMS.

A Pestilence in China.—It is reported that China has been visited by a pestilence which is said to resemble in character the great plague of London in 1665. The plague first appeared at Canton toward the end of April, following a period of prolonged drought. Tens of thousands of persons are said to have succumbed to its ravages in Canton and Pakhoi. It was first observed at Hongkong on the 8th of May, and on the 10th from thirty to forty deaths were reported daily. The disease is described as of a bubonic character, with purplish or black swellings of the glands, in the groins, armpits, under the knees, and in the neck, accompanied by intense fever, the temperature rising to 105° or 106°. It is rapid in its course. With or without premonitory warning in the shape of malaise or chill, there is a sudden elevation of fever, rising to 105° or over. There is much headache and cerebral disturbance, accompanied by stupor. Diarrhea at once sets in, and a state of delirium followed by coma is reached in three or four hours in bad cases, death ensuing, and the body turning black and becoming putrid and swollen to thrice its size in the course of from twelve to twenty-four hours. In other cases, in from twelve to twenty-four hours glandular swellings appear in the neck, armpits, and groins, rapidly enlarging to the size of fowls' eggs. They are hard and exceedingly tender. With or without a decline of the fever the patient sinks more deeply into a condition of coma and dies, usually at the end of forty-eight hours or sooner. If six days are reached recovery is hopeful. The glandular swellings show no signs of suppuration. In some cases epistaxis or hematemesis occurs; petechiæ appear in a few cases, but there is no regular eruption. Very strong men have resisted the attack for two days and then succumbed, but as many as 80 per cent. of those attacked in Canton died in one day. Those who held out for three or four days generally recovered, but they were very few.

A German Emgirant-station.—It is reported that the North German Lloyd and Hamburg-American steamship companies have taken steps to establish jointly an emigrant-station at Illowo, East Prussia, where steerage-passengers will be received, examined, washed, and disinfected before going aboard ship. The sheds at Illowo will cover some four hundred and fifty square meters.

An official notice says that the cholera was brought to Myslowitz, on the East Prussian frontier, by a Russian tramp. The members of the Health Board are convinced that the cholera is not likely to spread far from the frontier. All the patients have been isolated and no fresh case has been reported for several days.

Changes in the Woman's Medical College of Baltimore.—Dr. Charles E. Simon has been elected Professor of Physiology and Histology; Dr. Charles O'Donovan, Professor of Diseases of Children; Dr. Pearce Kintzing, Professor of Chemistry; Dr. Berwick B. Lanier, Lecturer on Pathology; Ralph Robinson, Esq., Lecturer on Medical Jurisprudence; Dr. Claribel Cone, Lecturer on Hygiene. The seven-months' session will be lengthened to eight months. A three-years' course has been required since 1884.

The Church and Cremation.—The Pope has expressed his opinion that cremation, while heretic in principle, may be allowed under special conditions which amount to a guarantee against a public scandal. The Catholic clergy may officiate at services over bodies which are to be cremated, but not at a crematorium.

Sir James Paget and Lady Paget celebrated the golden anniversary of their wedding-day on May 23d.

Dr. George G. Shoemaker died at his home at Knox, Pa., on May 20, 1894, at the age of thirty-eight years.